

THE NAUTICAL ALMANAC

AND ASTRONOMICAL EPHEMERIS
FOR THE YEAR

1935

FOR THE MERIDIAN OF THE
ROYAL OBSERVATORY AT GREENWICH

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PREFACE

The *Nautical Almanac* for 1935 follows the revised arrangement introduced in 1931. Advantage has been taken of the occasion of a change of printer to introduce various typographical improvements.

Variations have been replaced throughout by finite differences, which lend themselves more readily to interpolation.

The practice of giving logarithms of tabular quantities instead of their natural values is being abandoned, because of the more general use of calculating machines. Logarithms are no longer used in the Nautical Almanac Office. In this *Almanac* natural values of the true distance of Mercury from the Earth are given, as well as of some of the Besselian elements of eclipses. In the *Nautical Almanac* for 1937 the logarithms of the Besselian day numbers A , B , C , D will not appear.

The *G.M.T. of Transit of the Sun at Greenwich* is given for the first time (pages 22-29). This serves the purposes formerly served by the equation of time at apparent noon.

The *Besselian Day Number E* is now given at the foot of each page of Besselian day numbers (pages 266-273). The *Cape Independent Day Numbers* $1 + x$, $1 + y$ and $g' \div g_0$ are given for the first time (pages 275-289).

In the *Mean Places of Stars* (pages 296-307) some of the footnotes relating to double stars have been omitted, as the purpose of these footnotes is merely to prevent possible confusion or misidentification when observing with a transit instrument. The mean right ascensions of *Circumpolar Stars* (page 307) are now given to two decimals only.

In the *Besselian Elements of Eclipses* (pages 522-535) the former logarithmic values of $\sin d$, $\cos d$, $\tan f_1$ and $\tan f_2$ have been replaced by natural values. x' and y' are not given, as they may be deduced from the differences of x and y . The expressions for ξ' and η' applicable to each eclipse are included with the Besselian elements for the first time. An example of the calculation of the local circumstances of a partial solar eclipse has been given (page 805); an example of the calculation of the local circumstances of a total solar eclipse will be given in the *Nautical Almanac* for 1936. Various formulæ enabling quantities required in connection with eclipse observations to be computed in terms of the Besselian geometry have been given (page 804).

The occultation machine lent by Mr. J. D. McNeile has again been used to enable the elements of occultations to be deleted in cases where the occultation is not visible from any fixed observatory under favourable observing conditions with respect to altitude and darkness. A new machine is being constructed by a professional instrument maker, and will be used for the occultations for 1937.

Four pages of new tables relating to the *Satellites of Saturn* have been given (pages 838-841). Although appearing this year in the *Explanation*, they will be found in future issues in the pages devoted to *Satellites of Saturn*. They are based

on the recently published elements of the late G. Struve, and are intended to facilitate the prediction of eclipses, transits, shadow transits and occultations during the forthcoming passage of the Earth through the ring-plane. They have, however, been calculated from the elements with a rigour that will enable them to be used in the comparison of future observations with theory. A paper dealing with the prediction of satellite phenomena from these tables is being contributed to the *Memoirs of the British Astronomical Association*.

In the *Phenomena* (pages 640–641) the conjunctions of planets in pairs have been omitted if the difference of declination is greater than 3° .

The auxiliary interpolation tables (*Tables XVI–XXI*) have been revised and extended to cover the methods of interpolation most suitable for the material in the *Nautical Almanac*. They will also be found useful for the interpolation of other tables in which fifth and higher order differences are negligible.

The article on *The Calendar* (pages 754–770), written by Dr. J. K. Fotheringham, Reader in Ancient Astronomy and Chronology in the University of Oxford, has been revised and a new paragraph on *Subdivisions of the Day* added.

The *Explanation* has been revised and amplified. The principal additions are to be found under the headings *Eclipses* (page 800), *Satellites of Saturn* (page 834) and *Tables XVII–XXI* (page 851).

The *Sun's Co-ordinates X, Y, Z*, referred to the equinox of the beginning of the year (pages 30–37) will be omitted in the *Almanacs* for 1938 and later years; the co-ordinates referred to the equinox of 1950.0 (pages 46–53) will be retained. The heliocentric longitude, latitude and radius vector of Mercury will also be omitted for the first time in the *Nautical Almanac* for 1938.

The volume of *Planetary Co-ordinates for the Years 1800–1940 referred to the Equinox of 1950.0* has been published; a description will be found on page 777. Work has been begun on the volume for 1940–1960.

Another Nova-Brunsviga calculating machine, Model IVA, and a Hollerith 80-column punch were added to the equipment in 1933. Preparations are being made for doing a series of about 800,000 multiplications by the Hollerith Multiplying Punch. A 6-register National (formerly called the Ellis) machine was acquired in 1934 January; this machine will integrate a function from its sixth finite differences or difference a function to the fifth difference, printing the function and all its differences. Its introduction has led to new and improved technique in sub-tabulation, of which a full account will be given later.

The following papers, dealing with the equipment or methods of the Nautical Almanac Office, were published in 1933.

- (1) "The Computation of Total Solar Eclipses." *M.N.R.A.S.*, **93**, 175, 414 and 538.
- (2) "The Total Solar Eclipse of 1940 October 1." *M.N.R.A.S.*, **93**, 181.
- (3) "Computing the Nautical Almanac." *Nautical Magazine*, 1933 July.
- (4) "The Hollerith and Powers Tabulating Machines." Privately printed.

By international arrangement certain portions of the *Nautical Almanac* are supplied from the offices of the *American Ephemeris*, the *Connaissance des Temps*, the *Berliner Jahrbuch*, and the *Almanaque Nautico*, in exchange for portions of the *Nautical Almanac* supplied to those offices. These are as follows:—

From Washington.—Apparent places of stars marked A.E. at the foot of the column; eclipses; elements of occultations; satellites V, VI and VII of Jupiter; satellites of Saturn (except differential co-ordinates of Hyperion and Iapetus, and tables on pages 838–841); satellites of Uranus and Neptune; physical ephemerides of Sun, Moon (except position angle of terminator and fraction illuminated), Mercury, Venus, Mars and Jupiter; sunrise, sunset, moonrise and moonset; azimuth of Polaris at all hour angles.

From Paris.—Apparent places of circumpolar stars; eclipses; Jupiter's four great satellites.

From Berlin.—Apparent places of stars marked B.J. at the foot of the column; rings of Saturn; differential co-ordinates of Hyperion and Iapetus.

From San Fernando.—Apparent places of stars marked A.N. at the foot of the column.

The footnotes on pages 296–307 relating to double stars were kindly supplied by Dr. R. G. Aitken, Director of the Lick Observatory, Dr. W. H. van den Bos, of the Union Observatory, Johannesburg, and Professor G. van Biesbroeck, of the Yerkes Observatory.

The late appearance of this *Almanac*, which is due to causes beyond the control of the Superintendent, is much regretted. It is anticipated, however, that it will be possible to advance the date of publication of future *Almanacs*.

Thanks are due to the printers, Messrs. C. Tinling and Co., Ltd., for their co-operation in the efforts that have been made to establish standards for the presentation of tabular matter and of mathematical-astronomical text.

The staff at present consists of:—

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Superintendent

H.M. Nautical Almanac Office
Royal Naval College
Greenwich
London, S.E.10.

1934 April.

ERRATA, 1935

Nautical Almanac for the Year 1928

Page 174. Apparent Declination, September 13. For $3^{\circ} 30' 09''.4$ read $3^{\circ} 20' 09''.4$

Nautical Almanac for the Year 1933

Page 166. Upper Transit, Apparent Geocentric Declination of Centre, March 7. For $+24^{\circ} 39' 35''.6$ read $+24^{\circ} 39' 25''.6$

Page 502. Footnote. For July 9 read August 9

Nautical Almanac for the Year 1934

Pages 640–641. The greatest elongation of Mercury falls on July 31 according to the criterion on page 812. If the latitude of the planet is taken into account, the greatest elongation is on August 1.

Nautical Almanac for the Year 1935

Page 155. Moon's Right Ascension, December 1^d 8^h. For 29^h read 20^h

Golden Number	...	...	XVII	Solar Cycle	...	...	...	12
Epact	...	...	...	Roman Indiction	...	...	...	3
Dominical Letter	...	...	F	Julian Period (year of)	...	...	...	6648

FIXED AND MOVABLE FESTIVALS, ANNIVERSARIES, Etc.

Epiphany	...	...	...	Jan.	6	Union Day (Union of S. Africa)	May	31
Septuagesima Sunday	...	...	...	Feb.	17	Birthday of King George V	...	June 3
St. David	...	...	...	Mar.	1	Feast of Weeks (Jewish)	...	" 7
Quinquagesima (Shrove) Sunday	...	...	...	"	3	Whit Sunday—Pentecost	...	" 9
Ash Wednesday	...	...	...	"	6	Trinity Sunday	...	...
Quadragesima Sunday	...	...	...	...	...	Corpus Christi...	...	...
(1st in Lent)	...	...	...	"	10	Coronation Day	...	...
St. Patrick	...	...	...	"	17	Birthday of the Prince of Wales	...	" 23
Annunciation—Lady Day	...	...	...	"	25	St. John Bapt.—Midsummer	...	...
Mohammedan New Year (1354)	Apr.	5	Day	...	...	...	...	" 24
Summer Time begins	...	...	"	14	Dominion Day (Canada)	...	July	1
Palm Sunday	...	...	"	14	Jewish New Year (5696)	...	Sept.	28
Passover, First Day of	...	"	18	St. Michael—Michaelmas Day	...	"	29	
Good Friday	...	...	"	19	Summer Time ends	...	Oct.	6
Easter Day	...	...	"	21	Day of Atonement (Jewish)	...	"	7
St. George	...	...	"	23	Tabernacles (Jewish)	...	"	12
Anzac Day	...	...	"	25	Armistice Day	...	Nov.	11
Low Sunday	...	...	"	28	Ramadân (Moslem)	...	...	...
Accession of King George V	...	May	6	First Day of	...	...	"	27
Empire (Victoria) Day	...	"	24	St. Andrew	...	...	"	30
Rogation Sunday	...	"	26	1st Sunday in Advent	...	Dec.	1	
Birthday of Queen Mary	...	"	26	St. Thomas	...	...	"	21
Ascension Day—	...	...	...	Christmas Day (Wednesday)	...	"	25	
Holy Thursday	...	"	30					

CALENDAR, 1935

Day of Month	JANUARY				FEBRUARY				MARCH			
	Day of Week	Day of Year	Fraction of Year	Julian Day	Day of Week	Day of Year	Fraction of Year	Julian Day	Day of Week	Day of Year	Fraction of Year	Julian Day
1-0	Tu.	0	.000	2427 803.5	F.	31	.085	2427 834.5	F.	59	.162	2427 862.5
2-0	W.	1	.003	804.5	S.	32	.088	835.5	S.	60	.164	863.5
3-0	Th.	2	.005	805.5	S.	33	.090	836.5	S.	61	.167	864.5
4-0	F.	3	.008	806.5	M.	34	.093	837.5	M.	62	.170	865.5
5-0	S.	4	.011	807.5	Tu.	35	.096	838.5	Tu.	63	.172	866.5
6-0	S.	5	.014	808.5	W.	36	.099	839.5	W.	64	.175	867.5
7-0	M.	6	.016	809.5	Th.	37	.101	840.5	Th.	65	.178	868.5
8-0	Tu.	7	.019	810.5	F.	38	.104	841.5	F.	66	.181	869.5
9-0	W.	8	.022	811.5	S.	39	.107	842.5	S.	67	.183	870.5
10-0	Th.	9	.025	812.5	S.	40	.110	843.5	S.	68	.186	871.5
11-0	F.	10	.027	813.5	M.	41	.112	844.5	M.	69	.189	872.5
12-0	S.	11	.030	814.5	Tu.	42	.115	845.5	Tu.	70	.192	873.5
13-0	S.	12	.033	815.5	W.	43	.118	846.5	W.	71	.194	874.5
14-0	M.	13	.036	816.5	Th.	44	.120	847.5	Th.	72	.197	875.5
15-0	Tu.	14	.038	817.5	F.	45	.123	848.5	F.	73	.200	876.5
16-0	W.	15	.041	818.5	S.	46	.126	849.5	S.	74	.203	877.5
17-0	Th.	16	.044	819.5	S.	47	.129	850.5	S.	75	.205	878.5
18-0	F.	17	.047	820.5	M.	48	.131	851.5	M.	76	.208	879.5
19-0	S.	18	.049	821.5	Tu.	49	.134	852.5	Tu.	77	.211	880.5
20-0	S.	19	.052	822.5	W.	50	.137	853.5	W.	78	.214	881.5
21-0	M.	20	.055	823.5	Th.	51	.140	854.5	Th.	79	.216	882.5
22-0	Tu.	21	.057	824.5	F.	52	.142	855.5	F.	80	.219	883.5
23-0	W.	22	.060	825.5	S.	53	.145	856.5	S.	81	.222	884.5
24-0	Th.	23	.063	826.5	S.	54	.148	857.5	S.	82	.225	885.5
25-0	F.	24	.066	827.5	M.	55	.151	858.5	M.	83	.227	886.5
26-0	S.	25	.068	828.5	Tu.	56	.153	859.5	Tu.	84	.230	887.5
27-0	S.	26	.071	829.5	W.	57	.156	860.5	W.	85	.233	888.5
28-0	M.	27	.074	830.5	Th.	58	.159	861.5	Th.	86	.235	889.5
29-0	Tu.	28	.077	831.5					F.	87	.238	890.5
30-0	W.	29	.079	832.5					S.	88	.241	891.5
31-0	Th.	30	.082	833.5					S.	89	.244	892.5

The Day of the Year and the Fraction of the Year are reckoned from January 1st 0^h, and the latter is based on the tropical year of 365.2422 days. To obtain the Fraction of the Year from the commencement of the Besselian fictitious year (1935-0 or 1935 Jan. 1st 290), or the time when the Sun's mean longitude, affected by aberration, is 280°, the above fractions must be diminished by .001.

The Julian Day commences at noon.

Day of Month	APRIL				MAY				JUNE			
	Day of Week	Day of Year	Fraction of Year	Julian Day	Day of Week	Day of Year	Fraction of Year	Julian Day	Day of Week	Day of Year	Fraction of Year	Julian Day
				2427				2427				2427
1-0	M.	90	·246	893·5	W.	120	·329	923·5	S.	151	·413	954·5
2-0	Tu.	91	·249	894·5	Th.	121	·331	924·5	♄.	152	·416	955·5
3-0	W.	92	·252	895·5	F.	122	·334	925·5	M.	153	·419	956·5
4-0	Th.	93	·255	896·5	S.	123	·337	926·5	Tu.	154	·422	957·5
5-0	F.	94	·257	897·5	♄.	124	·340	927·5	W.	155	·424	958·5
6-0	S.	95	·260	898·5	M.	125	·342	928·5	Th.	156	·427	959·5
7-0	♄.	96	·263	899·5	Tu.	126	·345	929·5	F.	157	·430	960·5
8-0	M.	97	·266	900·5	W.	127	·348	930·5	S.	158	·433	961·5
9-0	Tu.	98	·268	901·5	Th.	128	·350	931·5	♄.	159	·435	962·5
10-0	W.	99	·271	902·5	F.	129	·353	932·5	M.	160	·438	963·5
11-0	Th.	100	·274	903·5	S.	130	·356	933·5	Tu.	161	·441	964·5
12-0	F.	101	·277	904·5	♄.	131	·359	934·5	W.	162	·444	965·5
13-0	S.	102	·279	905·5	M.	132	·361	935·5	Th.	163	·446	966·5
14-0	♄.	103	·282	906·5	Tu.	133	·364	936·5	F.	164	·449	967·5
15-0	M.	104	·285	907·5	W.	134	·367	937·5	S.	165	·452	968·5
16-0	Tu.	105	·287	908·5	Th.	135	·370	938·5	♄.	166	·454	969·5
17-0	W.	106	·290	909·5	F.	136	·372	939·5	M.	167	·457	970·5
18-0	Th.	107	·293	910·5	S.	137	·375	940·5	Tu.	168	·460	971·5
19-0	F.	108	·296	911·5	♄.	138	·378	941·5	W.	169	·463	972·5
20-0	S.	109	·298	912·5	M.	139	·381	942·5	Th.	170	·465	973·5
21-0	♄.	110	·301	913·5	Tu.	140	·383	943·5	F.	171	·468	974·5
22-0	M.	111	·304	914·5	W.	141	·386	944·5	S.	172	·471	975·5
23-0	Tu.	112	·307	915·5	Th.	142	·389	945·5	♄.	173	·474	976·5
24-0	W.	113	·309	916·5	F.	143	·392	946·5	M.	174	·476	977·5
25-0	Th.	114	·312	917·5	S.	144	·394	947·5	Tu.	175	·479	978·5
26-0	F.	115	·315	918·5	♄.	145	·397	948·5	W.	176	·482	979·5
27-0	S.	116	·318	919·5	M.	146	·400	949·5	Th.	177	·485	980·5
28-0	♄.	117	·320	920·5	Tu.	147	·402	950·5	F.	178	·487	981·5
29-0	M.	118	·323	921·5	W.	148	·405	951·5	S.	179	·490	982·5
30-0	Tu.	119	·326	922·5	Th.	149	·408	952·5	♄.	180	·493	983·5
31-0					F.	150	·411	953·5				

The Day of the Year and the Fraction of the Year are reckoned from January 1^d 0^h, and the latter is based on the tropical year of 365·2422 days. To obtain the Fraction of the Year from the commencement of the Besselian fictitious year (1935·0 or 1935 Jan. 1^d 290), or the time when the Sun's mean longitude, affected by aberration, is 280°, the above fractions must be diminished by ·001.

The Julian Day commences at noon.

CALENDAR, 1935

Day of Month	JULY				AUGUST				SEPTEMBER			
	Day of Week	Day of Year	Fraction of Year	Julian Day	Day of Week	Day of Year	Fraction of Year	Julian Day	Day of Week	Day of Year	Fraction of Year	Julian Day
				2427				2428				2428
1-0	M.	181	·496	984·5	Th.	212	·580	015·5	S.	243	·665	046·5
2-0	Tu.	182	·498	985·5	F.	213	·583	016·5	M.	244	·668	047·5
3-0	W.	183	·501	986·5	S.	214	·586	017·5	Tu.	245	·671	048·5
4-0	Th.	184	·504	987·5	S.	215	·589	018·5	W.	246	·674	049·5
5-0	F.	185	·507	988·5	M.	216	·591	019·5	Th.	247	·676	050·5
6-0	S.	186	·509	989·5	Tu.	217	·594	020·5	F.	248	·679	051·5
7-0	S.	187	·512	990·5	W.	218	·597	021·5	S.	249	·682	052·5
8-0	M.	188	·515	991·5	Th.	219	·600	022·5	S.	250	·684	053·5
9-0	Tu.	189	·517	992·5	F.	220	·602	023·5	M.	251	·687	054·5
10-0	W.	190	·520	993·5	S.	221	·605	024·5	Tu.	252	·690	055·5
11-0	Th.	191	·523	994·5	S.	222	·608	025·5	W.	253	·693	056·5
12-0	F.	192	·526	995·5	M.	223	·611	026·5	Th.	254	·695	057·5
13-0	S.	193	·528	996·5	Tu.	224	·613	027·5	F.	255	·698	058·5
14-0	S.	194	·531	997·5	W.	225	·616	028·5	S.	256	·701	059·5
15-0	M.	195	·534	998·5	Th.	226	·619	029·5	S.	257	·704	060·5
16-0	Tu.	196	·537	999·5	F.	227	·622	030·5	M.	258	·706	061·5
17-0	W.	197	·539	*000·5	S.	228	·624	031·5	Tu.	259	·709	062·5
18-0	Th.	198	·542	*001·5	S.	229	·627	032·5	W.	260	·712	063·5
19-0	F.	199	·545	*002·5	M.	230	·630	033·5	Th.	261	·715	064·5
20-0	S.	200	·548	*003·5	Tu.	231	·632	034·5	F.	262	·717	065·5
21-0	S.	201	·550	*004·5	W.	232	·635	035·5	S.	263	·720	066·5
22-0	M.	202	·553	*005·5	Th.	233	·638	036·5	S.	264	·723	067·5
23-0	Tu.	203	·556	*006·5	F.	234	·641	037·5	M.	265	·726	068·5
24-0	W.	204	·559	*007·5	S.	235	·643	038·5	Tu.	266	·728	069·5
25-0	Th.	205	·561	*008·5	S.	236	·646	039·5	W.	267	·731	070·5
26-0	F.	206	·564	*009·5	M.	237	·649	040·5	Th.	268	·734	071·5
27-0	S.	207	·567	*010·5	Tu.	238	·652	041·5	F.	269	·736	072·5
28-0	S.	208	·569	*011·5	W.	239	·654	042·5	S.	270	·739	073·5
29-0	M.	209	·572	*012·5	Th.	240	·657	043·5	S.	271	·742	074·5
30-0	Tu.	210	·575	*013·5	F.	241	·660	044·5	M.	272	·745	075·5
31-0	W.	211	·578	*014·5	S.	242	·663	045·5				

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The Julian Day commences at noon.

Day of Month	OCTOBER				NOVEMBER				DECEMBER			
	Day of Week	Day of Year	Fraction of Year	Julian Day	Day of Week	Day of Year	Fraction of Year	Julian Day	Day of Week	Day of Year	Fraction of Year	Julian Day
				2428				2428				2428
1-0	Tu.	273	.747	076.5	F.	304	.832	107.5	S.	334	.914	137.5
2-0	W.	274	.750	077.5	S.	305	.835	108.5	M.	335	.917	138.5
3-0	Th.	275	.753	078.5	S.	306	.838	109.5	Tu.	336	.920	139.5
4-0	F.	276	.756	079.5	M.	307	.841	110.5	W.	337	.923	140.5
5-0	S.	277	.758	080.5	Tu.	308	.843	111.5	Th.	338	.925	141.5
6-0	S.	278	.761	081.5	W.	309	.846	112.5	F.	339	.928	142.5
7-0	M.	279	.764	082.5	Th.	310	.849	113.5	S.	340	.931	143.5
8-0	Tu.	280	.767	083.5	F.	311	.851	114.5	S.	341	.934	144.5
9-0	W.	281	.769	084.5	S.	312	.854	115.5	M.	342	.936	145.5
10-0	Th.	282	.772	085.5	S.	313	.857	116.5	Tu.	343	.939	146.5
11-0	F.	283	.775	086.5	M.	314	.860	117.5	W.	344	.942	147.5
12-0	S.	284	.778	087.5	Tu.	315	.862	118.5	Th.	345	.945	148.5
13-0	S.	285	.780	088.5	W.	316	.865	119.5	F.	346	.947	149.5
14-0	M.	286	.783	089.5	Th.	317	.868	120.5	S.	347	.950	150.5
15-0	Tu.	287	.786	090.5	F.	318	.871	121.5	S.	348	.953	151.5
16-0	W.	288	.789	091.5	S.	319	.873	122.5	M.	349	.956	152.5
17-0	Th.	289	.791	092.5	S.	320	.876	123.5	Tu.	350	.958	153.5
18-0	F.	290	.794	093.5	M.	321	.879	124.5	W.	351	.961	154.5
19-0	S.	291	.797	094.5	Tu.	322	.882	125.5	Th.	352	.964	155.5
20-0	S.	292	.799	095.5	W.	323	.884	126.5	F.	353	.966	156.5
21-0	M.	293	.802	096.5	Th.	324	.887	127.5	S.	354	.969	157.5
22-0	Tu.	294	.805	097.5	F.	325	.890	128.5	S.	355	.972	158.5
23-0	W.	295	.808	098.5	S.	326	.893	129.5	M.	356	.975	159.5
24-0	Th.	296	.810	099.5	S.	327	.895	130.5	Tu.	357	.977	160.5
25-0	F.	297	.813	100.5	M.	328	.898	131.5	W.	358	.980	161.5
26-0	S.	298	.816	101.5	Tu.	329	.901	132.5	Th.	359	.983	162.5
27-0	S.	299	.819	102.5	W.	330	.904	133.5	F.	360	.986	163.5
28-0	M.	300	.821	103.5	Th.	331	.906	134.5	S.	361	.988	164.5
29-0	Tu.	301	.824	104.5	F.	332	.909	135.5	S.	362	.991	165.5
30-0	W.	302	.827	105.5	S.	333	.912	136.5	M.	363	.994	166.5
31-0	Th.	303	.830	106.5					Tu.	364	.997	167.5

The Day of the Year and the Fraction of the Year are reckoned from January 1st 0^h, and the latter is based on the tropical year of 365.2422 days. To obtain the Fraction of the Year from the commencement of the Besselian fictitious year (1935.0 or 1935 Jan. 1st 290), or the time when the Sun's mean longitude, affected by aberration, is 280°, the above fractions must be diminished by .001.

The Julian Day commences at noon.

Date	Apparent Right Ascension	Apparent Declination	Semi- diameter	Equation of Time Apparent - Mean	Sidereal Time
Jan. 1	^h 18 ^m 41 ^s 58.63 ^a 265.18	[°] -23 ['] 05 ["] 54.0	['] 16 ["] 17.50	^m - 3 ^s 06.43 ^a -28.62	^h 6 ^m 38 ^s 52.185
2	18 46 23.81 264.87	23 01 14.1 + 279.9	16 17.50	3 35.05 -28.31	6 42 48.747
3	18 50 48.68 264.54	22 56 06.6 307.5	16 17.50	4 03.36 27.98	6 46 45.311
4	18 55 13.22 264.17	22 50 31.5 335.1	16 17.50	4 31.34 27.61	6 50 41.876
5	18 59 37.39 263.75	22 44 29.2 389.4	16 17.49	4 58.95 27.20	6 54 38.443
6	19 04 01.14 263.32	-22 37 59.8 + 416.3	16 17.48	- 5 26.15 -26.76	6 58 35.008
7	19 08 24.46 262.84	22 31 03.5 442.9	16 17.47	5 52.91 26.28	7 02 31.570
8	19 12 47.30 262.33	22 23 40.6 469.4	16 17.46	6 19.19 25.77	7 06 28.128
9	19 17 09.63 261.80	22 15 51.2 495.6	16 17.44	6 44.96 25.24	7 10 24.683
10	19 21 31.43 261.23	22 07 35.6 521.5	16 17.40	7 10.20 24.68	7 14 21.236
11	19 25 52.66 260.65	-21 58 54.1 + 547.2	16 17.36	- 7 34.88 -24.08	7 18 17.788
12	19 30 13.31 260.04	21 49 46.9 572.6	16 17.33	7 58.96 23.48	7 22 14.340
13	19 34 33.35 259.40	21 40 14.3 597.7	16 17.29	8 22.44 22.84	7 26 10.895
14	19 38 52.75 258.75	21 30 16.6 622.5	16 17.24	8 45.28 22.20	7 30 07.453
15	19 43 11.50 258.08	21 19 54.1 647.0	16 17.19	9 07.48 21.52	7 34 04.013
16	19 47 29.58 257.39	-21 09 07.1 + 671.3	16 17.13	- 9 29.00 -20.84	7 38 00.577
17	19 51 46.97 256.70	20 57 55.8 695.2	16 17.07	9 49.84 20.14	7 41 57.140
18	19 56 03.67 255.99	20 46 20.6 718.9	16 17.00	10 09.98 19.43	7 45 53.702
19	20 00 19.66 255.26	20 34 21.7 742.2	16 16.92	10 29.41 18.70	7 49 50.264
20	20 04 34.92 254.53	20 21 59.5 765.1	16 16.84	10 48.11 17.97	7 53 46.823
21	20 08 49.45 253.79	-20 09 14.4 + 787.9	16 16.75	-11 06.08 -17.23	7 57 43.380
22	20 13 03.24 253.03	19 56 06.5 810.2	16 16.66	11 23.31 16.48	8 01 39.934
23	20 17 16.27 252.27	19 42 36.3 832.1	16 16.56	11 39.79 15.71	8 05 36.486
24	20 21 28.54 251.50	19 28 44.2 853.8	16 16.45	11 55.50 14.94	8 09 33.038
25	20 25 40.04 250.72	19 14 30.4 875.1	16 16.34	12 10.44 14.17	8 13 29.588
26	20 29 50.76 249.95	-18 59 55.3 + 896.1	16 16.23	-12 24.61 -13.39	8 17 26.139
27	20 34 00.71 249.15	18 44 59.2 916.6	16 16.11	12 38.00 12.60	8 21 22.693
28	20 38 09.86 248.37	18 29 42.6 936.7	16 15.98	12 50.60 11.81	8 25 19.248
29	20 42 18.23 247.58	18 14 05.9 956.6	16 15.85	13 02.41 11.02	8 29 15.805
30	20 46 25.81 246.77	17 58 09.3 976.0	16 15.71	13 13.43 10.21	8 33 12.367
31	20 50 32.58 245.97	-17 41 53.3 + 994.9	16 15.57	-13 23.64 -9.42	8 37 08.930
Feb. 1	20 54 38.55 245.16	17 25 18.4 1013.5	16 15.43	13 33.06 8.60	8 41 05.494
2	20 58 43.71 244.35	17 08 24.9 1031.7	16 15.29	13 41.66 7.80	8 45 02.057
3	21 02 48.06 243.54	16 51 13.2 1049.4	16 15.14	13 49.46 6.98	8 48 58.618
4	21 06 51.60 242.71	16 33 43.8 1066.6	16 14.99	13 56.44 6.16	8 52 55.176
5	21 10 54.31 241.90	-16 15 57.2 + 1083.5	16 14.84	-14 02.60 -5.33	8 56 51.729
6	21 14 56.21 241.07	15 57 53.7 1099.8	16 14.68	14 07.93 4.52	9 00 48.280
7	21 18 57.28 240.25	15 39 33.9 1115.8	16 14.52	14 12.45 3.69	9 04 44.830
8	21 22 57.53 239.43	15 20 58.1 1131.3	16 14.36	14 16.14 2.88	9 08 41.380
9	21 26 56.96 238.62	15 02 06.8 1146.4	16 14.19	14 19.02 2.06	9 12 37.932
10	21 30 55.58 237.81	-14 43 00.4 + 1161.0	16 14.03	-14 21.08 -1.26	9 16 34.487
11	21 34 53.39 237.02	14 23 39.4 1175.3	16 13.85	14 22.34 -0.46	9 20 31.044
12	21 38 50.41 236.23	14 04 04.1 1189.2	16 13.68	14 22.80 + 0.32	9 24 27.603
13	21 42 46.64 235.46	13 44 14.9 1202.6	16 13.50	14 22.48 1.10	9 28 24.165
14	21 46 42.10 234.69	13 24 12.3 1215.6	16 13.31	14 21.38 1.86	9 32 20.724
15	21 50 36.79 233.95	-13 03 56.7 + 1228.3	16 13.12	-14 19.52 + 2.61	9 36 17.284
16	21 54 30.74 233.18	-12 43 28.4	16 12.93	-14 16.91	9 40 13.841

Date	Mean Equinox of 1935-0		Logarithm of Radius Vector of the Earth	Prec. in Long.	Nut. in Long.	Nut. in R.A.	Transit of First Point of Aries
	Longitude	Latitude					
Jan.	1 279° 38' 46.7 ³	-0.62	9.992 6879 - 15	- 0.04	+14.81	+0.887	17 18 17.23
	2 280 39 57.0 ^{3670.3}	0.57	.992 6864 + 3	+ 0.10	14.86	.893	17 14 21.32
	3 281 41 07.6 ^{3670.6}	0.49	.992 6867 20	0.24	14.91	.902	17 10 25.41
	4 282 42 18.3 ^{3670.7}	0.38	.992 6887 36	0.37	14.97	.912	17 06 29.49
	5 283 43 29.1 ^{3670.8}	0.25	.992 6923 52	0.51	15.02	.923	17 02 33.58
	6 284 44 39.9 ^{3670.5}	-0.12	9.992 6975 + 67	+ 0.65	+15.07	+0.933	16 58 37.67
	7 285 45 50.4 ^{3670.3}	+0.02	.992 7042 84	0.79	15.12	.940	16 54 41.76
	8 286 47 00.7 ^{3669.9}	0.16	.992 7126 100	0.92	15.17	.942	16 50 45.84
	9 287 48 10.6 ^{3669.4}	0.28	.992 7226 119	1.06	15.22	.942	16 46 49.93
	10 288 49 20.0 ^{3668.8}	0.38	.992 7345 139	1.20	15.26	.939	16 42 54.02
	11 289 50 28.8 ^{3668.3}	+0.45	9.992 7484 + 160	+ 1.34	+15.31	+0.936	16 38 58.11
	12 290 51 37.1 ^{3667.6}	0.50	.992 7644 182	1.47	15.36	.933	16 35 02.19
	13 291 52 44.7 ^{3666.9}	0.51	.992 7826 206	1.61	15.40	.932	16 31 06.28
	14 292 53 51.6 ^{3666.3}	0.49	.992 8032 231	1.75	15.45	.935	16 27 10.37
	15 293 54 57.9 ^{3665.5}	0.45	.992 8263 256	1.89	15.49	.940	16 23 14.46
	16 294 56 03.4 ^{3664.9}	+0.37	9.992 8519 + 283	+ 2.02	+15.53	+0.948	16 19 18.55
	17 295 57 08.3 ^{3664.3}	0.26	.992 8802 310	2.16	15.57	.956	16 15 22.63
	18 296 58 12.6 ^{3663.6}	0.14	.992 9112 336	2.30	15.61	.963	16 11 26.72
	19 297 59 16.2 ^{3662.9}	+0.02	.992 9448 364	2.44	15.64	.969	16 07 30.81
	20 299 00 19.1 ^{3662.4}	-0.11	.992 9812 390	2.57	15.68	.973	16 03 34.90
	21 300 01 21.5 ^{3661.8}	-0.24	9.993 0202 + 417	+ 2.71	+15.71	+0.974	15 59 38.99
	22 301 02 23.3 ^{3661.1}	0.37	.993 0619 443	2.85	15.75	.973	15 55 43.07
	23 302 03 24.4 ^{3660.6}	0.48	.993 1062 469	2.99	15.78	.970	15 51 47.16
	24 303 04 25.0 ^{3660.0}	0.58	.993 1531 493	3.13	15.81	.966	15 47 51.25
	25 304 05 25.0 ^{3659.4}	0.65	.993 2024 517	3.26	15.84	.961	15 43 55.34
	26 305 06 24.4 ^{3658.8}	-0.70	9.993 2541 + 540	+ 3.40	+15.86	+0.957	15 39 59.43
	27 306 07 23.2 ^{3658.2}	0.71	.993 3081 561	3.54	15.89	.955	15 36 03.52
	28 307 08 21.4 ^{3657.6}	0.70	.993 3642 581	3.68	15.91	.955	15 32 07.61
	29 308 09 19.0 ^{3656.9}	0.65	.993 4223 600	3.81	15.93	.957	15 28 11.70
	30 309 10 15.9 ^{3656.3}	0.58	.993 4823 617	3.95	15.96	.963	15 24 15.79
Feb.	31 310 11 12.2 ^{3655.4}	-0.48	9.993 5440 + 632	+ 4.09	+15.97	+0.971	15 20 19.88
	1 311 12 07.6 ^{3654.6}	0.36	.993 6072 647	4.23	15.99	.979	15 16 23.97
	2 312 13 02.2 ^{3653.7}	0.22	.993 6719 659	4.36	16.01	.987	15 12 28.06
	3 313 13 55.9 ^{3652.6}	-0.08	.993 7378 671	4.50	16.02	.993	15 08 32.15
	4 314 14 48.5 ^{3651.5}	+0.06	.993 8049 683	4.64	16.03	.995	15 04 36.24
	5 315 15 40.0 ^{3650.1}	+0.18	9.993 8732 + 695	+ 4.78	+16.05	+0.993	15 00 40.33
	6 316 16 30.1 ^{3648.8}	0.29	.993 9427 708	4.91	16.05	.989	14 56 44.42
	7 317 17 18.9 ^{3647.3}	0.38	.994 0135 721	5.05	16.06	.983	14 52 48.51
	8 318 18 06.2 ^{3645.8}	0.45	.994 0856 736	5.19	16.07	.978	14 48 52.60
	9 319 18 52.0 ^{3644.1}	0.48	.994 1592 751	5.33	16.07	.975	14 44 56.69
	10 320 19 36.1 ^{3642.6}	+0.47	9.994 2343 + 768	+ 5.46	+16.08	+0.974	14 41 00.78
	11 321 20 18.7 ^{3640.9}	0.42	.994 3111 786	5.60	16.08	.976	14 37 04.87
	12 322 20 59.6 ^{3639.3}	0.35	.994 3897 805	5.74	16.08	.980	14 33 08.96
	13 323 21 38.9 ^{3637.6}	0.26	.994 4702 824	5.88	16.07	.986	14 29 13.05
	14 324 22 16.5 ^{3636.0}	0.16	.994 5526 845	6.02	16.07	.990	14 25 17.14
	15 325 22 52.5 ^{3634.4}	+0.04	9.994 6371 + 864	+ 6.15	+16.07	+0.994	14 21 21.23
	16 326 23 26.9	-0.08	9.994 7235	+ 6.29	+16.06	+0.996	14 17 25.32

Date	Apparent Right Ascension	Apparent Declination	Semi- diameter	Equation of Time Apparent - Mean	Sidereal Time
Feb. 16	^h ^m ^s 21 54 30.74 ^{233.21}	[°] ['] [″] -12 43 28.4 ^{+1240.5}	['] [″] 16 12.93	^m ^s -14 16.91 ^{+ 3.35}	^h ^m ^s 9 40 13.841
17	21 58 23.95 ^{232.49}	12 22 47.9 ^{1252.3}	16 12.73	14 13.56 ^{+ 4.06}	9 44 10.396
18	22 02 16.44 ^{231.79}	12 01 55.6 ^{1263.8}	16 12.53	14 09.50 ^{+ 4.77}	9 48 06.949
19	22 06 08.23 ^{231.10}	11 40 51.8 ^{1274.9}	16 12.32	14 04.73 ^{+ 5.45}	9 52 03.499
20	22 09 59.33 ^{230.43}	11 19 36.9 ^{1285.6}	16 12.11	13 59.28 ^{+ 6.12}	9 56 00.047
21	22 13 49.76 ^{229.78}	-10 58 11.3 ^{+1295.8}	16 11.89	-13 53.16 ^{+ 6.78}	9 59 56.596
22	22 17 39.54 ^{229.14}	10 36 35.5 ^{1305.7}	16 11.67	13 46.38 ^{+ 7.41}	10 03 53.144
23	22 21 28.68 ^{228.53}	10 14 49.8 ^{1315.3}	16 11.45	13 38.97 ^{+ 8.03}	10 07 49.694
24	22 25 17.21 ^{227.92}	9 52 54.5 ^{1324.3}	16 11.22	13 30.94 ^{+ 8.63}	10 11 46.246
25	22 29 05.13 ^{227.34}	9 30 50.2 ^{1333.1}	16 10.99	13 22.31 ^{+ 9.21}	10 15 42.800
26	22 32 52.47 ^{226.78}	- 9 08 37.1 ^{+1341.4}	16 10.75	-13 13.10 ^{+ 9.77}	10 19 39.357
27	22 36 39.25 ^{226.24}	8 46 15.7 ^{1349.3}	16 10.52	13 03.33 ^{+ 10.32}	10 23 35.917
28	22 40 25.49 ^{225.71}	8 23 46.4 ^{1356.8}	16 10.28	12 53.01 ^{+ 10.85}	10 27 32.478
Mar. 1	22 44 11.20 ^{225.19}	8 01 09.6 ^{1363.9}	16 10.03	12 42.16 ^{+ 11.36}	10 31 29.039
2	22 47 56.39 ^{224.69}	7 38 25.7 ^{1370.6}	16 09.79	12 30.80 ^{+ 11.86}	10 35 25.598
3	22 51 41.08 ^{224.21}	- 7 15 35.1 ^{+1376.9}	16 09.54	-12 18.94 ^{+ 12.34}	10 39 22.154
4	22 55 25.29 ^{223.75}	6 52 38.2 ^{1382.7}	16 09.30	12 06.60 ^{+ 12.81}	10 43 18.707
5	22 59 09.04 ^{223.29}	6 29 35.5 ^{1388.1}	16 09.05	11 53.79 ^{+ 13.27}	10 47 15.256
6	23 02 52.33 ^{222.84}	6 06 27.4 ^{1393.1}	16 08.80	11 40.52 ^{+ 13.70}	10 51 11.804
7	23 06 35.17 ^{222.43}	5 43 14.3 ^{1397.6}	16 08.55	11 26.82 ^{+ 14.13}	10 55 08.353
8	23 10 17.60 ^{222.01}	- 5 19 56.7 ^{+1401.8}	16 08.30	-11 12.69 ^{+ 14.54}	10 59 04.901
9	23 13 59.61 ^{221.62}	4 56 34.9 ^{1405.5}	16 08.05	10 58.15 ^{+ 14.94}	11 03 01.454
10	23 17 41.23 ^{221.25}	4 33 09.4 ^{1408.8}	16 07.80	10 43.21 ^{+ 15.31}	11 06 58.008
11	23 21 22.48 ^{220.89}	4 09 40.6 ^{1411.8}	16 07.55	10 27.90 ^{+ 15.66}	11 10 54.565
12	23 25 03.37 ^{220.55}	3 46 08.8 ^{1414.5}	16 07.30	10 12.24 ^{+ 16.00}	11 14 51.124
13	23 28 43.92 ^{220.24}	- 3 22 34.3 ^{+1416.6}	16 07.04	- 9 56.24 ^{+ 16.31}	11 18 47.683
14	23 32 24.16 ^{219.95}	2 58 57.7 ^{1418.5}	16 06.78	9 39.93 ^{+ 16.60}	11 22 44.241
15	23 36 04.11 ^{219.68}	2 35 19.2 ^{1420.0}	16 06.52	9 23.33 ^{+ 16.88}	11 26 40.797
16	23 39 43.79 ^{219.43}	2 11 39.2 ^{1421.2}	16 06.26	9 06.45 ^{+ 17.12}	11 30 37.351
17	23 43 23.22 ^{219.20}	1 47 58.0 ^{1422.0}	16 06.00	8 49.33 ^{+ 17.35}	11 34 33.902
18	23 47 02.42 ^{219.00}	- 1 24 16.0 ^{+1422.5}	16 05.74	- 8 31.98 ^{+ 17.56}	11 38 30.452
19	23 50 41.42 ^{218.82}	1 00 33.5 ^{1422.5}	16 05.47	8 14.42 ^{+ 17.73}	11 42 27.000
20	23 54 20.24 ^{218.66}	0 36 51.0 ^{1422.4}	16 05.20	7 56.69 ^{+ 17.89}	11 46 23.548
21	23 57 58.90 ^{218.53}	- 0 13 08.6 ^{1421.8}	16 04.93	7 38.80 ^{+ 18.02}	11 50 20.095
22	0 01 37.43 ^{218.42}	+ 0 10 33.2 ^{1420.9}	16 04.65	7 20.78 ^{+ 18.14}	11 54 16.642
23	0 05 15.85 ^{218.34}	+ 0 34 14.1 ^{+1419.6}	16 04.38	- 7 02.64 ^{+ 18.22}	11 58 13.193
24	0 08 54.19 ^{218.27}	0 57 53.7 ^{1418.0}	16 04.10	6 44.42 ^{+ 18.28}	12 02 09.745
25	0 12 32.46 ^{218.23}	1 21 31.7 ^{1416.1}	16 03.82	6 26.14 ^{+ 18.32}	12 06 06.300
26	0 16 10.69 ^{218.21}	1 45 07.8 ^{1413.9}	16 03.54	6 07.82 ^{+ 18.34}	12 10 02.858
27	0 19 48.90 ^{218.22}	2 08 41.7 ^{1411.3}	16 03.25	5 49.48 ^{+ 18.33}	12 13 59.417
28	0 23 27.12 ^{218.25}	+ 2 32 13.0 ^{+1408.2}	16 02.97	- 5 31.15 ^{+ 18.31}	12 17 55.977
29	0 27 05.37 ^{218.29}	2 55 41.2 ^{1405.0}	16 02.69	5 12.84 ^{+ 18.26}	12 21 52.536
30	0 30 43.66 ^{218.36}	3 19 06.2 ^{1401.2}	16 02.41	4 54.58 ^{+ 18.20}	12 25 49.093
31	0 34 22.02 ^{218.44}	3 42 27.4 ^{1397.2}	16 02.13	4 36.38 ^{+ 18.11}	12 29 45.646
Apr. 1	0 38 00.46 ^{218.53}	4 05 44.6 ^{1392.7}	16 01.84	4 18.27 ^{+ 18.02}	12 33 42.196
2	0 41 38.99 ^{218.65}	+ 4 28 57.3 ^{+1387.8}	16 01.56	- 4 00.25 ^{+ 17.90}	12 37 38.744
3	0 45 17.64	+ 4 52 05.1	16 01.29	- 3 42.35	12 41 35.292

Date	Mean Equinox of 1935-0		Logarithm of Radius Vector of the Earth	Prec. in Long.	Nut. in Long.	Nut. in R.A.	Transit of First Point of Aries
	Longitude	Latitude					
Feb. 16	326° 23' 26.9	-0.08	9.994 7235 + 885	+ 6.29	+16.06	+0.996	14 17 25.32
17	327 23 59.6	0.22	.994 8120 + 905	6.43	16.05	.996	14 13 29.41
18	328 24 30.8	0.35	.994 9025 + 926	6.57	16.04	.993	14 09 33.50
19	329 25 00.5	0.47	.994 9951 + 946	6.70	16.03	.988	14 05 37.59
20	330 25 28.6	0.57	.995 0897 + 966	6.84	16.02	.981	14 01 41.69
21	331 25 55.2	-0.65	9.995 1863 + 985	+ 6.98	+16.00	+0.974	13 57 45.78
22	332 26 20.3	0.70	.995 2848 + 1003	7.12	15.99	.967	13 53 49.87
23	333 26 43.9	0.73	.995 3851 + 1020	7.25	15.97	.962	13 49 53.96
24	334 27 06.1	0.72	.995 4871 + 1036	7.39	15.96	.958	13 45 58.05
25	335 27 26.9	0.69	.995 5907 + 1051	7.53	15.94	.957	13 42 02.14
26	336 27 46.2	-0.62	9.995 6958 + 1064	+ 7.67	+15.92	+0.958	13 38 06.24
27	337 28 04.2	0.53	.995 8022 + 1076	7.80	15.89	.963	13 34 10.33
28	338 28 20.7	0.42	.995 9098 + 1085	7.94	15.87	.969	13 30 14.42
Mar. 1	339 28 35.7	0.29	.996 0183 + 1093	8.08	15.85	.974	13 26 18.51
2	340 28 49.3	0.15	.996 1276 + 1099	8.22	15.82	.978	13 22 22.60
3	341 29 01.3	-0.01	9.996 2375 + 1104	+ 8.35	+15.80	+0.979	13 18 26.69
4	342 29 11.6	+0.13	.996 3479 + 1108	8.49	15.77	.976	13 14 30.79
5	343 29 20.2	0.24	.996 4587 + 1111	8.63	15.74	.970	13 10 34.88
6	344 29 27.0	0.33	.996 5698 + 1114	8.77	15.71	.963	13 06 38.97
7	345 29 31.9	0.39	.996 6812 + 1117	8.91	15.69	.956	13 02 43.06
8	346 29 34.7	+0.42	9.996 7929 + 1122	+ 9.04	+15.65	+0.949	12 58 47.16
9	347 29 35.4	0.42	.996 9051 + 1126	9.18	15.62	.946	12 54 51.25
10	348 29 34.0	0.39	.997 0177 + 1132	9.32	15.59	.945	12 50 55.34
11	349 29 30.4	0.34	.997 1309 + 1139	9.46	15.56	.947	12 46 59.43
12	350 29 24.6	0.25	.997 2448 + 1147	9.59	15.53	.950	12 43 03.53
13	351 29 16.6	+0.15	9.997 3595 + 1155	+ 9.73	+15.49	+0.954	12 39 07.62
14	352 29 06.3	+0.04	.997 4750 + 1164	9.87	15.46	.957	12 35 11.71
15	353 28 53.9	-0.07	.997 5914 + 1174	10.01	15.42	.957	12 31 15.80
16	354 28 39.3	0.20	.997 7088 + 1184	10.14	15.39	.956	12 27 19.90
17	355 28 22.5	0.33	.997 8272 + 1194	10.28	15.35	.952	12 23 23.99
18	356 28 03.5	-0.45	9.997 9466 + 1204	+ 10.42	+15.32	+0.946	12 19 28.08
19	357 27 42.5	0.56	.998 0670 + 1214	10.56	15.28	.939	12 15 32.18
20	358 27 19.4	0.63	.998 1884 + 1225	10.69	15.25	.931	12 11 36.27
21	359 26 54.3	0.68	.998 3109 + 1234	10.83	15.21	.923	12 07 40.36
22	0 26 27.2	0.70	.998 4343 + 1244	10.97	15.18	.915	12 03 44.45
23	1 25 58.1	-0.70	9.998 5587 + 1252	+ 11.11	+15.14	+0.910	11 59 48.55
24	2 25 27.2	0.68	.998 6839 + 1260	11.24	15.11	.907	11 55 52.64
25	3 24 54.5	0.64	.998 8099 + 1266	11.38	15.07	.907	11 51 56.73
26	4 24 19.9	0.55	.998 9365 + 1270	11.52	15.03	.909	11 48 00.82
27	5 23 43.6	0.44	.999 0635 + 1274	11.66	15.00	.913	11 44 04.92
28	6 23 05.5	-0.32	9.999 1909 + 1276	+ 11.80	+14.96	+0.918	11 40 09.01
29	7 22 25.7	0.19	.999 3185 + 1275	11.93	14.93	.921	11 36 13.10
30	8 21 44.2	-0.07	.999 4460 + 1273	12.07	14.89	.923	11 32 17.20
31	9 21 00.9	+0.06	.999 5733 + 1269	12.21	14.86	.920	11 28 21.29
Apr. 1	10 20 15.8	0.19	.999 7002 + 1263	12.35	14.83	.915	11 24 25.38
2	11 19 28.9	+0.28	9.999 8265 + 1257	+ 12.48	+14.79	+0.908	11 20 29.47
3	12 18 40.0	+0.34	9.999 9522 + 1257	+ 12.62	+14.76	+0.900	11 16 33.57

Date	Apparent Right Ascension	Apparent Declination	Semi- diameter	Equation of Time Apparent - Mean	Sidereal Time
Apr. 1	^{h m s} 0 38 00.46 ^{218.53}	^{° ' "} + 4 05 44.6 ^{+1392.7}	^{' "} 16 01.84	^{m s} - 4 18.27 ^{+18.02}	^{h m s} 12 33 42.196
2	0 41 38.99 ^{218.65}	4 28 57.3 ^{1387.8}	16 01.56	4 00.25 ^{17.90}	12 37 38.744
3	0 45 17.64 ^{218.78}	4 52 05.1 ^{1382.6}	16 01.29	3 42.35 ^{17.78}	12 41 35.292
4	0 48 56.42 ^{218.92}	5 15 07.7 ^{1377.1}	16 01.01	3 24.57 ^{17.63}	12 45 31.840
5	0 52 35.34 ^{219.07}	5 38 04.8 ^{1371.0}	16 00.73	3 06.94 ^{17.48}	12 49 28.390
6	0 56 14.41 ^{219.25}	+ 6 00 55.8 ^{+1364.8}	16 00.46	- 2 49.46 ^{+17.31}	12 53 24.945
7	0 59 53.66 ^{219.43}	6 23 40.6 ^{1358.0}	16 00.19	2 32.15 ^{17.12}	12 57 21.502
8	1 03 33.09 ^{219.63}	6 46 18.6 ^{1351.0}	15 59.92	2 15.03 ^{16.92}	13 01 18.060
9	1 07 12.72 ^{219.85}	7 08 49.6 ^{1343.6}	15 59.65	1 58.11 ^{16.71}	13 05 14.620
10	1 10 52.57 ^{220.09}	7 31 13.2 ^{1335.9}	15 59.38	1 41.40 ^{16.46}	13 09 11.179
11	1 14 32.66 ^{220.34}	+ 7 53 29.1 ^{+1327.8}	15 59.12	- 1 24.94 ^{+16.22}	13 13 07.736
12	1 18 13.00 ^{220.61}	8 15 36.9 ^{1319.4}	15 58.85	1 08.72 ^{15.94}	13 17 04.292
13	1 21 53.61 ^{220.90}	8 37 36.3 ^{1310.8}	15 58.58	0 52.78 ^{15.66}	13 21 00.845
14	1 25 34.51 ^{221.20}	8 59 27.1 ^{1301.7}	15 58.32	0 37.12 ^{15.35}	13 24 57.396
15	1 29 15.71 ^{221.53}	9 21 08.8 ^{1292.3}	15 58.06	0 21.77 ^{15.03}	13 28 53.945
16	1 32 57.24 ^{221.86}	+ 9 42 41.1 ^{+1282.7}	15 57.79	- 0 06.74 ^{+14.68}	13 32 50.492
17	1 36 39.10 ^{222.23}	10 04 03.8 ^{1272.7}	15 57.52	+ 0 07.94 ^{14.33}	13 36 47.041
18	1 40 21.33 ^{222.60}	10 25 16.5 ^{1262.5}	15 57.26	0 22.27 ^{13.96}	13 40 43.589
19	1 44 03.93 ^{222.99}	10 46 19.0 ^{1251.8}	15 57.00	0 36.23 ^{13.56}	13 44 40.140
20	1 47 46.92 ^{223.41}	11 07 10.8 ^{1240.9}	15 56.74	0 49.79 ^{13.15}	13 48 36.693
21	1 51 30.33 ^{223.83}	+ 11 27 51.7 ^{+1229.7}	15 56.47	+ 1 02.94 ^{+12.72}	13 52 33.248
22	1 55 14.16 ^{224.28}	11 48 21.4 ^{1218.1}	15 56.21	1 15.66 ^{12.27}	13 56 29.807
23	1 58 58.44 ^{224.74}	12 08 39.5 ^{1206.3}	15 55.95	1 27.93 ^{11.81}	14 00 26.368
24	2 02 43.18 ^{225.22}	12 28 45.8 ^{1194.0}	15 55.69	1 39.74 ^{11.34}	14 04 22.929
25	2 06 28.40 ^{225.71}	12 48 39.8 ^{1181.6}	15 55.43	1 51.08 ^{10.85}	14 08 19.490
26	2 10 14.11 ^{226.21}	+ 13 08 21.4 ^{+1168.7}	15 55.17	+ 2 01.93 ^{+10.35}	14 12 16.048
27	2 14 00.32 ^{226.72}	13 27 50.1 ^{1155.5}	15 54.91	2 12.28 ^{9.83}	14 16 12.603
28	2 17 47.04 ^{227.24}	13 47 05.6 ^{1142.0}	15 54.66	2 22.11 ^{9.31}	14 20 09.157
29	2 21 34.28 ^{227.78}	14 06 07.6 ^{1128.2}	15 54.40	2 31.42 ^{8.78}	14 24 05.706
30	2 25 22.06 ^{228.31}	14 24 55.8 ^{1113.9}	15 54.15	2 40.20 ^{8.24}	14 28 02.255
May 1	2 29 10.37 ^{228.84}	+ 14 43 29.7 ^{+1099.4}	15 53.91	+ 2 48.44 ^{+7.71}	14 31 58.805
2	2 32 59.21 ^{229.39}	15 01 49.1 ^{1084.4}	15 53.67	2 56.15 ^{7.17}	14 35 55.357
3	2 36 48.60 ^{229.94}	15 19 53.5 ^{1069.2}	15 53.43	3 03.32 ^{6.62}	14 39 51.911
4	2 40 38.54 ^{230.48}	15 37 42.7 ^{1053.7}	15 53.19	3 09.94 ^{6.08}	14 43 48.469
5	2 44 29.02 ^{231.02}	15 55 16.4 ^{1037.8}	15 52.96	3 16.02 ^{5.53}	14 47 45.030
6	2 48 20.04 ^{231.58}	+ 16 12 34.2 ^{+1021.6}	15 52.74	+ 3 21.55 ^{+4.98}	14 51 41.592
7	2 52 11.62 ^{232.12}	16 29 35.8 ^{1005.0}	15 52.51	3 26.53 ^{4.43}	14 55 38.153
8	2 56 03.74 ^{232.68}	16 46 20.8 ^{988.3}	15 52.29	3 30.96 ^{3.88}	14 59 34.713
9	2 59 56.42 ^{233.23}	17 02 49.1 ^{971.1}	15 52.08	3 34.84 ^{3.32}	15 03 31.272
10	3 03 49.65 ^{233.78}	17 19 00.2 ^{953.7}	15 51.86	3 38.16 ^{2.78}	15 07 27.827
11	3 07 43.43 ^{234.34}	+ 17 34 53.9 ^{+936.0}	15 51.65	+ 3 40.94 ^{+2.21}	15 11 24.380
12	3 11 37.77 ^{234.90}	17 50 29.9 ^{918.1}	15 51.44	3 43.15 ^{1.66}	15 15 20.933
13	3 15 32.67 ^{235.46}	18 05 48.0 ^{899.8}	15 51.22	3 44.81 ^{1.10}	15 19 17.483
14	3 19 28.13 ^{236.01}	18 20 47.8 ^{881.3}	15 51.04	3 45.91 ^{+0.54}	15 23 14.033
15	3 23 24.14 ^{236.57}	18 35 29.1 ^{862.5}	15 50.83	3 46.45 ^{-0.01}	15 27 10.584
16	3 27 20.71 ^{237.13}	+ 18 49 51.6 ^{+843.4}	15 50.64	+ 3 46.44 ^{-0.58}	15 31 07.136
17	3 31 17.84	+ 19 03 55.0	15 50.44	+ 3 45.86	15 35 03.691

Date	Mean Equinox of 1935-0		Logarithm of Radius Vector of the Earth	Prec. in Long.	Nut. in Long.	Nut. in R.A.	Transit of First Point of Aries
	Longitude	Latitude					
Apr. 1	10 20 15.8 3553.1	+0.19	9.999 7002	+12.35	+14.83	+0.915	11 24 25.38
2	11 19 28.9 3551.1	0.28	.999 8265	12.48	14.79	.908	11 20 29.47
3	12 18 40.0 3549.1	0.34	9.999 9522	12.62	14.76	.900	11 16 33.57
4	13 17 49.1 3547.1	0.37	0.000 0772	12.76	14.73	.893	11 12 37.66
5	14 16 56.2 3544.9	0.38	.000 2015	12.90	14.70	.888	11 08 41.75
6	15 16 01.1 3542.7	+0.35	0.000 3249	+13.03	+14.67	+0.887	11 04 45.84
7	16 15 03.8 3540.4	0.30	.000 4477	13.17	14.64	.889	11 00 49.94
8	17 14 04.2 3538.2	0.23	.000 5699	13.31	14.61	.892	10 56 54.03
9	18 13 02.4 3535.9	0.13	.000 6915	13.45	14.58	.896	10 52 58.12
10	19 11 58.3 3533.6	+0.01	.000 8127	13.58	14.55	.900	10 49 02.21
11	20 10 51.9 3531.3	-0.12	0.000 9335	+13.72	+14.53	+0.902	10 45 06.30
12	21 09 43.2 3529.1	0.24	.001 0540	13.86	14.50	.902	10 41 10.40
13	22 08 32.3 3526.9	0.36	.001 1742	14.00	14.48	.900	10 37 14.49
14	23 07 19.2 3524.6	0.48	.001 2943	14.13	14.45	.895	10 33 18.58
15	24 06 03.8 3522.5	0.57	.001 4142	14.27	14.43	.889	10 29 22.67
16	25 04 46.3 3520.4	-0.65	0.001 5340	+14.41	+14.41	+0.881	10 25 26.76
17	26 03 26.7 3518.4	0.71	.001 6537	14.55	14.39	.874	10 21 30.86
18	27 02 05.1 3516.3	0.75	.001 7734	14.69	14.37	.867	10 17 34.95
19	28 00 41.4 3514.5	0.76	.001 8931	14.82	14.35	.863	10 13 39.04
20	28 59 15.9 3512.5	0.73	.002 0127	14.96	14.33	.860	10 09 43.13
21	29 57 48.4 3510.8	-0.67	0.002 1322	+15.10	+14.32	+0.860	10 05 47.22
22	30 56 19.2 3509.1	0.59	.002 2516	15.24	14.30	.864	10 01 51.31
23	31 54 48.3 3507.4	0.49	.002 3708	15.37	14.29	.869	9 57 55.40
24	32 53 15.7 3505.7	0.37	.002 4896	15.51	14.28	.875	9 53 59.50
25	33 51 41.4 3504.3	0.24	.002 6079	15.65	14.27	.880	9 50 03.59
26	34 50 05.7 3502.7	-0.11	0.002 7256	+15.79	+14.26	+0.883	9 46 07.68
27	35 48 28.4 3501.1	+0.02	.002 8424	15.92	14.25	.883	9 42 11.77
28	36 46 49.5 3499.7	0.15	.002 9582	16.06	14.24	.881	9 38 15.86
29	37 45 09.2 3498.1	0.24	.003 0728	16.20	14.24	.875	9 34 19.95
30	38 43 27.3 3496.5	0.31	.003 1861	16.34	14.23	.869	9 30 24.04
May 1	39 41 43.8 3494.9	+0.35	0.003 2979	+16.47	+14.23	+0.863	9 26 28.13
2	40 39 58.7 3493.2	0.36	.003 4081	16.61	14.23	.860	9 22 32.22
3	41 38 11.9 3491.5	0.34	.003 5167	16.75	14.23	.859	9 18 36.31
4	42 36 23.4 3489.7	0.29	.003 6235	16.89	14.23	.861	9 14 40.40
5	43 34 33.1 3487.9	0.22	.003 7286	17.02	14.24	.867	9 10 44.49
6	44 32 41.0 3486.0	+0.12	0.003 8321	+17.16	+14.24	+0.873	9 06 48.58
7	45 30 47.0 3484.1	0.00	.003 9339	17.30	14.24	.879	9 02 52.67
8	46 28 51.1 3482.2	-0.12	.004 0342	17.44	14.25	.884	8 58 56.76
9	47 26 53.3 3480.4	0.24	.004 1330	17.58	14.26	.887	8 55 00.85
10	48 24 53.7 3478.5	0.36	.004 2305	17.71	14.27	.887	8 51 04.94
11	49 22 52.2 3476.7	-0.47	0.004 3266	+17.85	+14.28	+0.885	8 47 09.03
12	50 20 48.9 3475.0	0.57	.004 4215	17.99	14.29	.882	8 43 13.12
13	51 18 43.9 3473.1	0.65	.004 5153	18.13	14.31	.877	8 39 17.21
14	52 16 37.0 3471.4	0.71	.004 6079	18.26	14.32	.872	8 35 21.30
15	53 14 28.4 3469.8	0.74	.004 6995	18.40	14.34	.867	8 31 25.39
16	54 12 18.2 3468.1	-0.73	0.004 7901	+18.54	+14.36	+0.864	8 27 29.48
17	55 10 06.3	-0.70	0.004 8798	+18.68	+14.38	+0.863	8 23 33.57

Date	Apparent Right Ascension	Apparent Declination	Semi- diameter	Equation of Time Apparent - Mean	Sidereal Time
May 17	^{h m s} 3 31 17.84 237.69	^{° ' "} +19 03 55.0 + 824.1	^{' "} 15 50.44	^{m s} + 3 45.86 - 1.13	^{h m s} 15 35 03.691
18	3 35 15.53 238.25	19 17 39.1 804.5	15 50.25	3 44.73 1.69	15 39 00.248
19	3 39 13.78 238.81	19 31 03.6 784.7	15 50.05	3 43.04 2.25	15 42 56.808
20	3 43 12.59 239.36	19 44 08.3 764.6	15 49.86	3 40.79 2.81	15 46 53.370
21	3 47 11.95 239.92	19 56 52.9 744.3	15 49.67	3 37.98 3.36	15 50 49.934
22	3 51 11.87 240.47	+20 09 17.2 723.7	15 49.49	+ 3 34.62 - 3.91	15 54 46.497
23	3 55 12.34 241.01	20 21 20.9 702.8	15 49.30	3 30.71 4.46	15 58 43.059
24	3 59 13.35 241.56	20 33 03.7 681.8	15 49.12	3 26.25 5.00	16 02 39.618
25	4 03 14.91 242.09	20 44 25.5 660.4	15 48.95	3 21.25 5.53	16 06 36.173
26	4 07 17.00 242.60	20 55 25.9 638.9	15 48.77	3 15.72 6.05	16 10 32.726
27	4 11 19.60 243.12	+21 06 04.8 617.1	15 48.60	+ 3 09.67 - 6.56	16 14 29.277
28	4 15 22.72 243.61	21 16 21.9 595.0	15 48.43	3 03.11 7.05	16 18 25.829
29	4 19 26.33 244.08	21 26 16.9 572.8	15 48.27	2 56.06 7.53	16 22 22.381
30	4 23 30.41 244.55	21 35 49.7 550.4	15 48.12	2 48.53 7.99	16 26 18.937
31	4 27 34.96 244.99	21 45 00.1 527.6	15 47.96	2 40.54 8.43	16 30 15.496
June 1	4 31 39.95 245.41	+21 53 47.7 504.8	15 47.82	+ 2 32.11 - 8.85	16 34 12.057
2	4 35 45.36 245.81	22 02 12.5 481.8	15 47.67	2 23.26 9.25	16 38 08.621
3	4 39 51.17 246.18	22 10 14.3 458.5	15 47.54	2 14.01 9.63	16 42 05.184
4	4 43 57.35 246.55	22 17 52.8 435.1	15 47.41	2 04.38 9.99	16 46 01.747
5	4 48 03.90 246.88	22 25 07.9 411.6	15 47.28	1 54.39 10.32	16 49 58.308
6	4 52 10.78 247.20	+22 31 59.5 387.9	15 47.16	+ 1 44.07 - 10.64	16 53 54.867
7	4 56 17.98 247.50	22 38 27.4 364.0	15 47.05	1 33.43 10.94	16 57 51.423
8	5 00 25.48 247.77	22 44 31.4 340.2	15 46.93	1 22.49 11.21	17 01 47.976
9	5 04 33.25 248.03	22 50 11.6 316.1	15 46.82	1 11.28 11.47	17 05 44.529
10	5 08 41.28 248.26	22 55 27.7 291.9	15 46.71	0 59.81 11.70	17 09 41.081
11	5 12 49.54 248.47	+23 00 19.6 267.6	15 46.61	+ 0 48.11 - 11.92	17 13 37.634
12	5 16 58.01 248.67	23 04 47.2 243.3	15 46.52	0 36.19 12.11	17 17 34.187
13	5 21 06.68 248.84	23 08 50.5 218.9	15 46.42	0 24.08 12.28	17 21 30.741
14	5 25 15.52 248.99	23 12 29.4 194.3	15 46.33	+ 0 11.80 12.43	17 25 27.300
15	5 29 24.51 249.13	23 15 43.7 169.8	15 46.25	- 0 00.63 12.57	17 29 23.860
16	5 33 33.64 249.24	+23 18 33.5 145.2	15 46.17	- 0 13.20 - 12.69	17 33 20.422
17	5 37 42.88 249.34	23 20 58.7 120.5	15 46.08	0 25.89 12.78	17 37 16.988
18	5 41 52.22 249.42	23 22 59.2 95.8	15 46.01	0 38.67 12.86	17 41 13.553
19	5 46 01.64 249.48	23 24 35.0 71.0	15 45.93	0 51.53 12.93	17 45 10.116
20	5 50 11.12 249.52	23 25 46.0 46.3	15 45.86	1 04.46 12.96	17 49 06.678
21	5 54 20.64 249.55	+23 26 32.3 21.4	15 45.79	- 1 17.42 - 12.99	17 53 03.235
22	5 58 30.19 249.55	23 26 53.7 3.4	15 45.73	1 30.41 12.99	17 56 59.791
23	6 02 39.74 249.52	23 26 50.3 28.2	15 45.67	1 43.40 12.97	18 00 56.343
24	6 06 49.26 249.48	23 26 22.1 53.0	15 45.61	1 56.37 12.92	18 04 52.894
25	6 10 58.74 249.41	23 25 29.1 77.9	15 45.56	2 09.29 12.85	18 08 49.447
26	6 15 08.15 249.31	+23 24 11.2 102.5	15 45.51	- 2 22.14 - 12.75	18 12 46.003
27	6 19 17.46 249.19	23 22 28.7 127.3	15 45.47	2 34.89 12.63	18 16 42.561
28	6 23 26.65 249.04	23 20 21.4 152.0	15 45.43	2 47.52 12.48	18 20 39.122
29	6 27 35.69 248.86	23 17 49.4 176.5	15 45.40	3 00.00 12.31	18 24 35.685
30	6 31 44.55 248.66	23 14 52.9 201.0	15 45.38	3 12.31 12.10	18 28 32.249
July 1	6 35 53.21 248.43	+23 11 31.9 225.3	15 45.36	- 3 24.41 - 11.87	18 32 28.814
2	6 40 01.64	+23 07 46.6	15 45.34	- 3 36.28	18 36 25.375

Date	Mean Equinox of 1935.0		Logarithm of Radius Vector of the Earth	Prec. in Long.	Nut. in Long.	Nut. in R.A.	Transit of First Point of Aries			
	Longitude	Latitude								
May	17	55 10 06.3 3466.7	-0.70	0.004 8798	+ 889	+18.68	+14.38	+0.863	8 23 33.57	
	18	56 07 53.0 3465.2	0.65	0.004 9687	879	18.81	14.40	.865	8 19 37.66	
	19	57 05 38.2 3463.8	0.58	0.005 0566	871	18.95	14.42	.870	8 15 41.75	
	20	58 03 22.0 3462.6	0.48	0.005 1437	862	19.09	14.44	.876	8 11 45.84	
	21	59 01 04.6 3461.4	0.36	0.005 2299	851	19.23	14.47	.885	8 07 49.93	
	22	59 58 46.0 3460.3	-0.23	0.005 3150	+ 841	+19.36	+14.49	+0.893	8 03 54.02	
	23	60 56 26.3 3459.3	-0.10	0.005 3991	828	19.50	14.52	.899	7 59 58.11	
	24	61 54 05.6 3458.4	+0.03	0.005 4819	813	19.64	14.55	.903	7 56 02.19	
	25	62 51 44.0 3457.4	0.15	0.005 5632	799	19.78	14.58	.903	7 52 06.28	
	26	63 49 21.4 3456.5	0.26	0.005 6431	781	19.91	14.61	.900	7 48 10.37	
	27	64 46 57.9 3455.6	+0.34	0.005 7212	+ 762	+20.05	+14.64	+0.896	7 44 14.46	
	28	65 44 33.5 3454.7	0.39	0.005 7974	742	20.19	14.67	.892	7 40 18.55	
	29	66 42 08.2 3453.7	0.40	0.005 8716	720	20.33	14.70	.889	7 36 22.64	
	30	67 39 41.9 3452.9	0.38	0.005 9436	698	20.47	14.74	.890	7 32 26.73	
	31	68 37 14.8 3451.8	0.33	0.006 0134	674	20.60	14.77	.893	7 28 30.81	
	June	1	69 34 46.6 3450.8	+0.26	0.006 0808	+ 650	+20.74	+14.81	+0.899	7 24 34.90
		2	70 32 17.4 3449.8	0.17	0.006 1458	627	20.88	14.84	.908	7 20 38.99
		3	71 29 47.2 3448.6	+0.06	0.006 2085	604	21.02	14.88	.915	7 16 43.08
		4	72 27 15.8 3447.5	-0.06	0.006 2689	581	21.15	14.92	.923	7 12 47.17
		5	73 24 43.3 3446.5	0.19	0.006 3270	559	21.29	14.96	.929	7 08 51.26
		6	74 22 09.8 3445.3	-0.31	0.006 3829	+ 537	+21.43	+15.00	+0.932	7 04 55.34
		7	75 19 35.1 3444.2	0.43	0.006 4366	517	21.57	15.04	.933	7 00 59.43
		8	76 16 59.3 3443.0	0.53	0.006 4883	497	21.70	15.08	.931	6 57 03.52
		9	77 14 22.3 3442.0	0.61	0.006 5380	478	21.84	15.12	.928	6 53 07.61
		10	78 11 44.3 3441.0	0.67	0.006 5858	460	21.98	15.17	.925	6 49 11.70
		11	79 09 05.3 3440.0	-0.71	0.006 6318	+ 443	+22.12	+15.21	+0.922	6 45 15.78
		12	80 06 25.3 3439.0	0.72	0.006 6761	426	22.25	15.25	.920	6 41 19.87
		13	81 03 44.3 3438.1	0.70	0.006 7187	411	22.39	15.29	.919	6 37 23.96
		14	82 01 02.4 3437.3	0.65	0.006 7598	396	22.53	15.34	.922	6 33 28.05
		15	82 58 19.7 3436.5	0.57	0.006 7994	383	22.67	15.38	.927	6 29 32.13
		16	83 55 36.2 3435.9	-0.48	0.006 8377	+ 369	+22.80	+15.43	+0.934	6 25 36.22
17		84 52 52.1 3435.3	0.37	0.006 8746	356	22.94	15.47	.944	6 21 40.31	
18		85 50 07.4 3434.8	0.24	0.006 9102	343	23.08	15.52	.954	6 17 44.40	
19		86 47 22.2 3434.5	-0.10	0.006 9445	328	23.22	15.56	.962	6 13 48.49	
20		87 44 36.7 3434.2	+0.05	0.006 9773	313	23.36	15.61	.968	6 09 52.57	
21		88 41 50.9 3434.1	+0.17	0.007 0086	+ 297	+23.49	+15.66	+0.970	6 05 56.66	
22		89 39 05.0 3433.9	0.29	0.007 0383	280	23.63	15.70	.970	6 02 00.75	
23		90 36 18.9 3433.8	0.38	0.007 0663	260	23.77	15.75	.967	5 58 04.84	
24		91 33 32.7 3433.8	0.44	0.007 0923	239	23.91	15.79	.963	5 54 08.92	
25		92 30 46.5 3433.8	0.46	0.007 1162	217	24.04	15.84	.960	5 50 13.01	
26		93 28 00.3 3433.7	+0.45	0.007 1379	+ 194	+24.18	+15.88	+0.961	5 46 17.10	
27		94 25 14.0 3433.7	0.42	0.007 1573	169	24.32	15.93	.964	5 42 21.19	
28		95 22 27.7 3433.7	0.36	0.007 1742	144	24.46	15.98	.969	5 38 25.28	
29		96 19 41.4 3433.5	0.26	0.007 1886	118	24.59	16.02	.977	5 34 29.36	
30		97 16 54.9 3433.5	0.14	0.007 2004	92	24.73	16.06	.986	5 30 33.45	
July	1	98 14 08.4 3433.3	+0.02	0.007 2096	+ 66	+24.87	+16.11	+0.995	5 26 37.54	
	2	99 11 21.7	-0.11	0.007 2162		+25.01	+16.15	+1.001	5 22 41.63	

Date	Apparent Right Ascension	Apparent Declination	Semi- diameter	Equation of Time Apparent - Mean	Sidereal Time
July 1	^h ^m ^s 6 35 53.21 ^{248.43}	[°] ['] ["] +23 11 31.9 ^{-225.3}	['] ["] 15 45.36	^m ^s - 3 24.41 ^{-11.87}	^h ^m ^s 18 32 28.814
2	6 40 01.64 ^{248.18}	23 07 46.6 ^{249.7}	15 45.34	3 36.28 ^{11.62}	18 36 25.375
3	6 44 09.82 ^{247.89}	23 03 36.9 ^{273.8}	15 45.33	3 47.90 ^{11.33}	18 40 21.935
4	6 48 17.71 ^{247.59}	22 59 03.1 ^{297.9}	15 45.33	3 59.23 ^{11.03}	18 44 18.492
5	6 52 25.30 ^{247.26}	22 54 05.2 ^{321.8}	15 45.33	4 10.26 ^{10.70}	18 48 15.046
6	6 56 32.56 ^{246.91}	+22 48 43.4 ^{-345.5}	15 45.34	- 4 20.96 ^{-10.36}	18 52 11.599
7	7 00 39.47 ^{246.54}	22 42 57.9 ^{369.1}	15 45.35	4 31.32 ^{9.98}	18 56 08.151
8	7 04 46.01 ^{246.15}	22 36 48.8 ^{392.6}	15 45.37	4 41.30 ^{9.59}	19 00 04.702
9	7 08 52.16 ^{245.75}	22 30 16.2 ^{415.9}	15 45.39	4 50.89 ^{9.19}	19 04 01.255
10	7 12 57.91 ^{245.31}	22 23 20.3 ^{439.0}	15 45.42	5 00.08 ^{8.76}	19 07 57.809
11	7 17 03.22 ^{244.88}	+22 16 01.3 ^{-462.0}	15 45.45	- 5 08.84 ^{-8.32}	19 11 54.365
12	7 21 08.10 ^{244.42}	22 08 19.3 ^{484.7}	15 45.48	5 17.16 ^{7.86}	19 15 50.925
13	7 25 12.52 ^{243.94}	22 00 14.6 ^{507.3}	15 45.52	5 25.02 ^{7.39}	19 19 47.486
14	7 29 16.46 ^{243.47}	21 51 47.3 ^{529.6}	15 45.56	5 32.41 ^{6.91}	19 23 44.051
15	7 33 19.93 ^{242.97}	21 42 57.7 ^{551.9}	15 45.61	5 39.32 ^{6.41}	19 27 40.615
16	7 37 22.90 ^{242.48}	+21 33 45.8 ^{-573.9}	15 45.66	- 5 45.73 ^{-5.92}	19 31 37.178
17	7 41 25.38 ^{241.97}	21 24 11.9 ^{595.8}	15 45.71	5 51.65 ^{5.41}	19 35 33.741
18	7 45 27.35 ^{241.46}	21 14 16.1 ^{617.4}	15 45.76	5 57.06 ^{4.90}	19 39 30.298
19	7 49 28.81 ^{240.93}	21 03 58.7 ^{638.8}	15 45.82	6 01.96 ^{4.38}	19 43 26.853
20	7 53 29.74 ^{240.41}	20 53 19.9 ^{660.0}	15 45.88	6 06.34 ^{3.85}	19 47 23.407
21	7 57 30.15 ^{239.88}	+20 42 19.9 ^{-681.0}	15 45.94	- 6 10.19 ^{-3.32}	19 51 19.957
22	8 01 30.03 ^{239.33}	20 30 58.9 ^{701.8}	15 46.01	6 13.51 ^{2.78}	19 55 16.508
23	8 05 29.36 ^{238.78}	20 19 17.1 ^{722.2}	15 46.08	6 16.29 ^{2.22}	19 59 13.062
24	8 09 28.14 ^{238.22}	20 07 14.9 ^{742.6}	15 46.16	6 18.51 ^{1.67}	20 03 09.618
25	8 13 26.36 ^{237.66}	19 54 52.3 ^{762.5}	15 46.24	6 20.18 ^{1.10}	20 07 06.176
26	8 17 24.02 ^{237.08}	+19 42 09.8 ^{-782.3}	15 46.32	- 6 21.28 ^{-0.52}	20 11 02.738
27	8 21 21.10 ^{236.50}	19 29 07.5 ^{801.7}	15 46.41	6 21.80 ^{+0.05}	20 14 59.300
28	8 25 17.60 ^{235.91}	19 15 45.8 ^{820.9}	15 46.51	6 21.75 ^{0.65}	20 18 55.864
29	8 29 13.51 ^{235.31}	19 02 04.9 ^{839.8}	15 46.61	6 21.10 ^{1.25}	20 22 52.424
30	8 33 08.82 ^{234.70}	18 48 05.1 ^{858.3}	15 46.71	6 19.85 ^{1.85}	20 26 48.982
31	8 37 03.52 ^{234.10}	+18 33 46.8 ^{-876.6}	15 46.83	- 6 18.00 ^{+2.46}	20 30 45.539
Aug. 1	8 40 57.62 ^{233.49}	18 19 10.2 ^{894.6}	15 46.94	6 15.54 ^{3.07}	20 34 42.092
2	8 44 51.11 ^{232.87}	18 04 15.6 ^{912.3}	15 47.06	6 12.47 ^{3.68}	20 38 38.644
3	8 48 43.98 ^{232.25}	17 49 03.3 ^{929.6}	15 47.19	6 08.79 ^{4.30}	20 42 35.195
4	8 52 36.23 ^{231.64}	17 33 33.7 ^{946.7}	15 47.32	6 04.49 ^{4.92}	20 46 31.744
5	8 56 27.87 ^{231.02}	+17 17 47.0 ^{-963.4}	15 47.46	- 5 59.57 ^{+5.54}	20 50 28.294
6	9 00 18.89 ^{230.41}	17 01 43.6 ^{979.8}	15 47.60	5 54.03 ^{6.15}	20 54 24.846
7	9 04 09.30 ^{229.80}	16 45 23.8 ^{996.0}	15 47.75	5 47.88 ^{6.76}	20 58 21.399
8	9 07 59.10 ^{229.18}	16 28 47.8 ^{1011.9}	15 47.90	5 41.12 ^{7.37}	21 02 17.956
9	9 11 48.28 ^{228.58}	16 11 55.9 ^{1027.3}	15 48.05	5 33.75 ^{7.97}	21 06 14.514
10	9 15 36.86 ^{227.99}	+15 54 48.6 ^{-1042.6}	15 48.21	- 5 25.78 ^{+8.57}	21 10 11.075
11	9 19 24.85 ^{227.40}	15 37 26.0 ^{1057.5}	15 48.36	5 17.21 ^{9.16}	21 14 07.638
12	9 23 12.25 ^{226.82}	15 19 48.5 ^{1072.2}	15 48.53	5 08.05 ^{9.74}	21 18 04.199
13	9 26 59.07 ^{226.25}	15 01 56.3 ^{1086.5}	15 48.69	4 58.31 ^{10.30}	21 22 00.759
14	9 30 45.32 ^{225.70}	14 43 49.8 ^{1100.6}	15 48.86	4 48.01 ^{10.85}	21 25 57.317
15	9 34 31.02 ^{225.16}	+14 25 29.2 ^{-1114.4}	15 49.03	- 4 37.16 ^{+11.40}	21 29 53.872
16	9 38 16.18 ^{224.58}	+14 06 54.8 ^{-1128.8}	15 49.20	- 4 25.76 ^{+11.90}	21 33 50.422

Date	Mean Equinox of 1935-0		Logarithm of Radius Vector of the Earth	Prec. in Long.	Nut. in Long.	Nut. in R.A.	Transit of First Point of Aries
	Longitude	Latitude					
July 1	98 14 08.4 3433.3	+0.02	0.007 2096	+24.87	+16.11	+0.995	5 26 37.54
2	99 11 21.7 3433.2	-0.11	0.007 2162	25.01	16.15	1.001	5 22 41.63
3	100 08 34.9 3432.9	0.23	0.007 2202	25.14	16.19	1.005	5 18 45.71
4	101 05 47.8 3432.8	0.36	0.007 2216	25.28	16.24	1.007	5 14 49.80
5	102 03 00.6 3432.6	0.47	0.007 2206	25.42	16.28	1.006	5 10 53.89
6	103 00 13.2 3432.5	-0.56	0.007 2172	+25.56	+16.32	+1.003	5 06 57.98
7	103 57 25.7 3432.2	0.63	0.007 2114	25.69	16.36	1.000	5 03 02.07
8	104 54 37.9 3432.1	0.68	0.007 2034	25.83	16.40	0.996	4 59 06.15
9	105 51 50.0 3432.0	0.70	0.007 1933	25.97	16.44	0.993	4 55 10.24
10	106 49 02.0 3431.9	0.69	0.007 1811	26.11	16.48	0.992	4 51 14.33
11	107 46 13.9 3431.8	-0.65	0.007 1669	+26.25	+16.52	+0.993	4 47 18.42
12	108 43 25.7 3431.8	0.58	0.007 1510	26.38	16.56	0.997	4 43 22.51
13	109 40 37.5 3431.9	0.48	0.007 1334	26.52	16.60	1.003	4 39 26.60
14	110 37 49.4 3432.0	0.37	0.007 1142	26.66	16.63	0.012	4 35 30.68
15	111 35 01.4 3432.2	0.24	0.007 0935	26.80	16.67	0.021	4 31 34.77
16	112 32 13.6 3432.6	-0.10	0.007 0714	+26.93	+16.70	+1.029	4 27 38.86
17	113 29 26.2 3433.1	+0.04	0.007 0480	27.07	16.73	0.036	4 23 42.95
18	114 26 39.3 3433.6	0.18	0.007 0232	27.21	16.77	0.038	4 19 47.04
19	115 23 52.9 3434.2	0.30	0.006 9970	27.35	16.80	0.038	4 15 51.13
20	116 21 07.1 3435.0	0.39	0.006 9693	27.48	16.83	0.036	4 11 55.22
21	117 18 22.1 3435.8	+0.46	0.006 9401	+27.62	+16.86	+1.031	4 07 59.30
22	118 15 37.9 3436.7	0.50	0.006 9091	27.76	16.88	0.027	4 04 03.39
23	119 12 54.6 3437.5	0.51	0.006 8763	27.90	16.91	0.025	4 00 07.48
24	120 10 12.1 3438.5	0.48	0.006 8415	28.03	16.94	0.026	3 56 11.57
25	121 07 30.6 3439.3	0.41	0.006 8046	28.17	16.96	0.029	3 52 15.66
26	122 04 49.9 3440.2	+0.32	0.006 7655	+28.31	+16.98	+1.035	3 48 19.75
27	123 02 10.1 3441.2	0.21	0.006 7241	28.45	17.01	0.042	3 44 23.84
28	123 59 31.3 3442.0	+0.09	0.006 6803	28.58	17.03	0.050	3 40 27.93
29	124 56 53.3 3442.8	-0.03	0.006 6340	28.72	17.05	0.055	3 36 32.02
30	125 54 16.1 3443.6	0.16	0.006 5854	28.86	17.06	0.058	3 32 36.11
Aug. 31	126 51 39.7 3444.4	-0.29	0.006 5343	+29.00	+17.08	+1.059	3 28 40.20
1	127 49 04.1 3445.2	0.41	0.006 4808	29.14	17.10	0.057	3 24 44.29
2	128 46 29.3 3445.9	0.50	0.006 4249	29.27	17.11	0.054	3 20 48.38
3	129 43 55.2 3446.7	0.57	0.006 3668	29.41	17.12	0.049	3 16 52.47
4	130 41 21.9 3447.4	0.62	0.006 3064	29.55	17.14	0.043	3 12 56.56
5	131 38 49.3 3448.2	-0.65	0.006 2438	+29.69	+17.15	+1.038	3 09 00.65
6	132 36 17.5 3449.0	0.64	0.006 1792	29.82	17.15	0.034	3 05 04.74
7	133 33 46.5 3449.7	0.61	0.006 1126	29.96	17.16	0.032	3 01 08.83
8	134 31 16.2 3450.4	0.56	0.006 0442	30.10	17.17	0.033	2 57 12.92
9	135 28 46.6 3451.3	0.47	0.005 9740	30.24	17.17	0.036	2 53 17.01
10	136 26 17.9 3452.2	-0.36	0.005 9023	+30.37	+17.18	+1.042	2 49 21.10
11	137 23 50.1 3453.0	0.23	0.005 8292	30.51	17.18	0.049	2 45 25.19
12	138 21 23.1 3454.0	-0.09	0.005 7548	30.65	17.18	0.055	2 41 29.28
13	139 18 57.1 3455.1	+0.06	0.005 6793	30.79	17.18	0.060	2 37 33.37
14	140 16 32.2 3456.3	0.19	0.005 6027	30.92	17.17	0.062	2 33 37.46
15	141 14 08.5 3457.6	+0.31	0.005 5252	+31.06	+17.17	+1.062	2 29 41.55
16	142 11 46.1	+0.41	0.005 4467	+31.20	+17.17	+1.057	2 25 45.64

Date	Apparent Right Ascension	Apparent Declination	Semi- diameter	Equation of Time Apparent-Mean	Sidereal Time
Aug. 16	^h 9 ^m 38 ^s 16.18 ^s 224.63	+14° 06' 54.8" -1127.9	15' 49".20	- 4 25.76 +11.92	^h 21 ^m 33 ^s 50.422
17	9 42 00.81 ^s 224.13	13 48 06.9 -1141.2	15 49.38	4 13.84 +11.92	21 37 46.972
18	9 45 44.94 ^s 223.63	13 29 05.7 -1154.1	15 49.55	4 01.41 +12.93	21 41 43.521
19	9 49 28.57 ^s 223.14	13 09 51.6 -1166.8	15 49.73	3 48.48 +13.41	21 45 40.072
20	9 53 11.71 ^s 222.67	12 50 24.8 -1179.1	15 49.91	3 35.07 +13.88	21 49 36.625
21	9 56 54.38 ^s 222.22	+12 30 45.7 -1191.1	15 50.09	- 3 21.19 +14.34	21 53 33.181
22	10 00 36.60 ^s 221.77	12 10 54.6 -1202.8	15 50.28	3 06.85 +14.78	21 57 29.740
23	10 04 18.37 ^s 221.33	11 50 51.8 -1214.2	15 50.47	2 52.07 +15.22	22 01 26.300
24	10 07 59.70 ^s 220.90	11 30 37.6 -1225.3	15 50.67	2 36.85 +15.65	22 05 22.860
25	10 11 40.60 ^s 220.50	11 10 12.3 -1235.9	15 50.86	2 21.20 +16.06	22 09 19.420
26	10 15 21.10 ^s 220.09	+10 49 36.4 -1246.3	15 51.07	- 2 05.14 +16.46	22 13 15.976
27	10 19 01.19 ^s 219.70	10 28 50.1 -1256.3	15 51.27	1 48.68 +16.86	22 17 12.531
28	10 22 40.89 ^s 219.33	10 07 53.8 -1266.0	15 51.48	1 31.82 +17.23	22 21 09.083
29	10 26 20.22 ^s 218.96	9 46 47.8 -1275.3	15 51.70	1 14.59 +17.59	22 25 05.633
30	10 29 59.18 ^s 218.60	9 25 32.5 -1284.3	15 51.92	0 57.00 +17.95	22 29 02.182
31	10 33 37.78 ^s 218.27	+ 9 04 08.2 -1292.9	15 52.14	- 0 39.05 +18.29	22 32 58.730
Sept. 1	10 37 16.05 ^s 217.94	8 42 35.3 -1301.2	15 52.37	0 20.76 +18.61	22 36 55.277
2	10 40 53.99 ^s 217.63	8 20 54.1 -1309.2	15 52.60	- 0 02.15 +18.92	22 40 51.827
3	10 44 31.62 ^s 217.34	7 59 04.9 -1316.8	15 52.83	+ 0 16.77 +19.22	22 44 48.377
4	10 48 08.96 ^s 217.05	7 37 08.1 -1324.1	15 53.07	0 35.99 +19.50	22 48 44.929
5	10 51 46.01 ^s 216.79	+ 7 15 04.0 -1331.1	15 53.31	+ 0 55.49 +19.76	22 52 41.485
6	10 55 22.80 ^s 216.55	6 52 52.9 -1337.7	15 53.55	1 15.25 +20.01	22 56 38.043
7	10 58 59.35 ^s 216.31	6 30 35.2 -1344.0	15 53.79	1 35.26 +20.24	23 00 34.602
8	11 02 35.66 ^s 216.10	6 08 11.2 -1350.0	15 54.04	1 55.50 +20.45	23 04 31.163
9	11 06 11.76 ^s 215.91	5 45 41.2 -1355.7	15 54.29	2 15.95 +20.64	23 08 27.721
10	11 09 47.67 ^s 215.74	+ 5 23 05.5 -1361.1	15 54.54	+ 2 36.59 +20.82	23 12 24.278
11	11 13 23.41 ^s 215.60	5 00 24.4 -1366.1	15 54.79	2 57.41 +20.96	23 16 20.831
12	11 16 59.01 ^s 215.47	4 37 38.3 -1370.9	15 55.04	3 18.37 +21.08	23 20 17.381
13	11 20 34.48 ^s 215.37	4 14 47.4 -1375.4	15 55.30	3 39.45 +21.18	23 24 13.930
14	11 24 09.85 ^s 215.30	3 51 52.0 -1379.6	15 55.55	4 00.63 +21.25	23 28 10.477
15	11 27 45.15 ^s 215.25	+ 3 28 52.4 -1383.6	15 55.80	+ 4 21.88 +21.31	23 32 07.026
16	11 31 20.40 ^s 215.22	3 05 48.8 -1387.1	15 56.06	4 43.19 +21.33	23 36 03.577
17	11 34 55.62 ^s 215.21	2 42 41.7 -1390.4	15 56.31	5 04.52 +21.34	23 40 00.130
18	11 38 30.83 ^s 215.24	2 19 31.3 -1393.3	15 56.57	5 25.86 +21.32	23 43 56.687
19	11 42 06.07 ^s 215.27	1 56 18.0 -1395.9	15 56.82	5 47.18 +21.28	23 47 53.246
20	11 45 41.34 ^s 215.33	+ 1 33 02.1 -1398.2	15 57.08	+ 6 08.46 +21.23	23 51 49.805
21	11 49 16.67 ^s 215.40	1 09 43.9 -1400.2	15 57.34	6 29.69 +21.15	23 55 46.363
22	11 52 52.07 ^s 215.50	0 46 23.7 -1401.6	15 57.60	6 50.84 +21.05	23 59 42.920
23	11 56 27.57 ^s 215.61	+ 0 23 02.1 -1402.9	15 57.86	7 11.89 +20.94	0 03 39.474
24	12 00 03.18 ^s 215.75	- 0 00 20.8 -1403.7	15 58.13	7 32.83 +20.81	0 07 36.026
25	12 03 38.93 ^s 215.89	- 0 23 44.5 -1404.2	15 58.39	+ 7 53.64 +20.65	0 11 32.576
26	12 07 14.82 ^s 216.07	0 47 08.7 -1404.3	15 58.66	8 14.29 +20.49	0 15 29.123
27	12 10 50.89 ^s 216.25	1 10 33.0 -1404.0	15 58.93	8 34.78 +20.30	0 19 25.671
28	12 14 27.14 ^s 216.46	1 33 57.0 -1403.4	15 59.21	8 55.08 +20.10	0 23 22.217
29	12 18 03.60 ^s 216.67	1 57 20.4 -1402.5	15 59.48	9 15.18 +19.88	0 27 18.765
30	12 21 40.27 ^s 216.92	- 2 20 42.9 -1401.0	15 59.76	+ 9 35.06 +19.64	0 31 15.315
Oct. 1	12 25 17.19 ^s 217.19	- 2 44 03.9 -1400.0	16 00.04	+ 9 54.70 +19.40	0 35 11.866

Date	Mean Equinox of 1935.0		Logarithm of Radius Vector of the Earth	Prec. in Long.	Nut. in Long.	Nut. in R.A.	Transit of First Point of Aries	
	Longitude	Latitude						
Aug. 16	142 11 46.1 3458.9	+0.41	0.005 4467	- 794	+31.20	+17.17	+1.057	2 25 45.64
17	143 09 25.0 3460.5	0.50	0.005 3673	805	31.34	17.16	.051	2 21 49.73
18	144 07 05.5 3462.0	0.55	0.005 2868	815	31.47	17.15	.045	2 17 53.82
19	145 04 47.5 3463.6	0.56	0.005 2053	828	31.61	17.14	.040	2 13 57.91
20	146 02 31.1 3465.3	0.55	0.005 1225	842	31.75	17.13	.038	2 10 02.00
21	147 00 16.4 3467.1	+0.51	0.005 0383	- 856	+31.89	+17.12	+1.039	2 06 06.10
22	147 58 03.5 3468.7	0.44	0.004 9527	871	32.03	17.11	.042	2 02 10.19
23	148 55 52.2 3470.4	0.34	0.004 8656	888	32.16	17.09	.047	1 58 14.28
24	149 53 42.6 3472.2	0.22	0.004 7768	906	32.30	17.08	.052	1 54 18.37
25	150 51 34.8 3473.8	+0.09	0.004 6862	924	32.44	17.06	.056	1 50 22.46
26	151 49 28.6 3475.5	-0.03	0.004 5938	- 943	+32.58	+17.04	+1.057	1 46 26.55
27	152 47 24.1 3477.1	0.14	0.004 4995	960	32.71	17.02	.057	1 42 30.65
28	153 45 21.2 3478.7	0.25	0.004 4035	979	32.85	17.00	.053	1 38 34.74
29	154 43 19.9 3480.3	0.35	0.004 3056	997	32.99	16.98	.048	1 34 38.83
30	155 41 20.2 3481.9	0.44	0.004 2059	1015	33.13	16.96	.041	1 30 42.92
Sept. 31	156 39 22.1 3483.4	-0.49	0.004 1044	-1033	+33.26	+16.93	+1.034	1 26 47.01
1	157 37 25.5 3484.9	0.51	0.004 0011	1049	33.40	16.91	.026	1 22 51.11
2	158 35 30.4 3486.4	0.52	0.003 8962	1064	33.54	16.88	.020	1 18 55.20
3	159 33 36.8 3487.9	0.50	0.003 7898	1080	33.68	16.86	.015	1 14 59.29
4	160 31 44.7 3489.3	0.44	0.003 6818	1093	33.81	16.83	.012	1 11 03.38
5	161 29 54.0 3490.8	-0.36	0.003 5725	-1105	+33.95	+16.80	+1.012	1 07 07.47
6	162 28 04.8 3492.3	0.25	0.003 4620	1116	34.09	16.77	.015	1 03 11.57
7	163 26 17.1 3493.7	-0.13	0.003 3504	1126	34.23	16.74	.019	0 59 15.66
8	164 24 30.8 3495.1	+0.01	0.003 2378	1133	34.36	16.71	.024	0 55 19.75
9	165 22 45.9 3496.8	0.14	0.003 1245	1138	34.50	16.68	.027	0 51 23.84
10	166 21 02.7 3498.3	+0.28	0.003 0107	-1143	+34.64	+16.64	+1.028	0 47 27.94
11	167 19 21.0 3500.0	0.41	0.002 8964	1146	34.78	16.61	.026	0 43 32.03
12	168 17 41.0 3501.8	0.53	0.002 7818	1148	34.92	16.58	.021	0 39 36.12
13	169 16 02.8 3503.7	0.62	0.002 6670	1150	35.05	16.54	.014	0 35 40.21
14	170 14 26.5 3505.6	0.68	0.002 5520	1151	35.19	16.51	.006	0 31 44.31
15	171 12 52.1 3507.6	+0.71	0.002 4369	-1153	+35.33	+16.47	+1.000	0 27 48.40
16	172 11 19.7 3509.8	0.70	0.002 3216	1156	35.47	16.43	0.995	0 23 52.49
17	173 09 49.5 3511.9	0.66	0.002 2060	1159	35.60	16.40	0.993	0 19 56.59
18	174 08 21.4 3514.2	0.60	0.002 0901	1164	35.74	16.36	0.995	0 16 00.68
19	175 06 55.6 3516.4	0.51	0.001 9737	1169	35.88	16.32	0.998	0 12 04.77
20	176 05 32.0 3518.7	+0.41	0.001 8568	-1177	+36.02	+16.28	+1.002	0 08 08.86
21	177 04 10.7 3520.8	0.29	0.001 7391	1184	36.15	16.25	1.005	0 04 129.6
22	178 02 51.5 3523.1	0.17	0.001 6207	1191	36.29	16.21	1.006	{ 0 00 17.05 } 23 56 21.14
23	179 01 34.6 3525.2	+0.06	0.001 5016	1201	36.43	16.17	1.005	23 52 25.23
24	180 00 19.8 3527.4	-0.04	0.001 3815	1209	36.57	16.13	1.001	23 48 29.33
25	180 59 07.2 3529.5	-0.14	0.001 2606	-1219	+36.70	+16.09	+0.996	23 44 33.42
26	181 57 56.7 3531.6	0.21	0.001 1387	1227	36.84	16.05	.988	23 40 37.51
27	182 56 48.3 3533.7	0.26	0.001 0160	1237	36.98	16.02	.980	23 36 41.60
28	183 55 42.0 3535.6	0.28	0.000 8923	1245	37.12	15.98	.971	23 32 45.70
29	184 54 37.6 3537.6	0.28	0.000 7678	1254	37.25	15.94	.964	23 28 49.79
30	185 53 35.2 3539.6	-0.25	0.000 6424	-1261	+37.39	+15.90	+0.958	23 24 53.88
Oct. 1	186 52 34.8	-0.20	0.000 5163		+37.53	+15.87	+0.954	23 20 57.98

Date	Apparent Right Ascension	Apparent Declination	Semi- diameter	Equation of Time Apparent-Mean	Sidereal Time
Oct. 1	^h 12 ^m 25 ^s 17.19 ^{217.17}	[°] - 2 ['] 44 ["] 03.9 ^{-1399.4}	['] 16 00.04	^m + 9 54.70 ^{+19.38}	^h 0 35 ^m 11.866
2	12 28 54.36 ^{217.45}	3 07 23.3 ^{-1397.2}	16 00.32	10 14.08 ^{+19.10}	0 39 08.420
3	12 32 31.81 ^{217.74}	3 30 40.5 ^{-1394.8}	16 00.60	10 33.18 ^{+18.82}	0 43 04.977
4	12 36 09.55 ^{218.04}	3 53 55.3 ^{-1391.9}	16 00.88	10 52.00 ^{+18.50}	0 47 01.535
5	12 39 47.59 ^{218.38}	4 17 07.2 ^{-1388.8}	16 01.17	11 10.50 ^{+18.18}	0 50 58.095
6	12 43 25.97 ^{218.73}	- 4 40 16.0 ^{-1385.2}	16 01.45	+11 28.68 ^{+17.83}	0 54 54.654
7	12 47 04.70 ^{219.09}	5 03 21.2 ^{-1381.3}	16 01.73	11 46.51 ^{+17.46}	0 58 51.211
8	12 50 43.79 ^{219.48}	5 26 22.5 ^{-1377.0}	16 02.02	12 03.97 ^{+17.07}	1 02 47.765
9	12 54 23.27 ^{219.89}	5 49 19.5 ^{-1372.5}	16 02.30	12 21.04 ^{+16.66}	1 06 44.316
10	12 58 03.16 ^{220.33}	6 12 12.0 ^{-1367.5}	16 02.58	12 37.70 ^{+16.23}	1 10 40.864
11	13 01 43.49 ^{220.78}	- 6 34 59.5 ^{-1362.3}	16 02.86	+12 53.93 ^{+15.77}	1 14 37.412
12	13 05 24.27 ^{221.26}	6 57 41.8 ^{-1356.7}	16 03.14	13 09.70 ^{+15.29}	1 18 33.960
13	13 09 05.53 ^{221.77}	7 20 18.5 ^{-1350.8}	16 03.42	13 24.99 ^{+14.79}	1 22 30.510
14	13 12 47.30 ^{222.29}	7 42 49.3 ^{-1344.4}	16 03.69	13 39.78 ^{+14.26}	1 26 27.064
15	13 16 29.59 ^{222.85}	8 05 13.7 ^{-1337.7}	16 03.96	13 54.04 ^{+13.70}	1 30 23.621
16	13 20 12.44 ^{223.42}	- 8 27 31.4 ^{-1330.7}	16 04.24	+14 07.74 ^{+13.14}	1 34 20.180
17	13 23 55.86 ^{224.01}	8 49 42.1 ^{-1323.4}	16 04.51	14 20.88 ^{+12.54}	1 38 16.740
18	13 27 39.87 ^{224.62}	9 11 45.5 ^{-1315.5}	16 04.77	14 33.42 ^{+11.94}	1 42 13.300
19	13 31 24.49 ^{225.24}	9 33 41.0 ^{-1307.3}	16 05.04	14 45.36 ^{+11.31}	1 46 09.859
20	13 35 09.73 ^{225.89}	9 55 28.3 ^{-1298.7}	16 05.31	14 56.67 ^{+10.66}	1 50 06.415
21	13 38 55.62 ^{226.55}	-10 17 07.0 ^{-1289.7}	16 05.57	+15 07.33 ^{+10.01}	1 54 02.967
22	13 42 42.17 ^{227.22}	10 38 36.7 ^{-1280.3}	16 05.84	15 17.34 ^{+9.33}	1 57 59.519
23	13 46 29.39 ^{227.90}	10 59 57.0 ^{-1270.5}	16 06.10	15 26.67 ^{+8.65}	2 01 56.068
24	13 50 17.29 ^{228.61}	11 21 07.5 ^{-1260.2}	16 06.36	15 35.32 ^{+7.95}	2 05 52.617
25	13 54 05.90 ^{229.31}	11 42 07.7 ^{-1249.6}	16 06.63	15 43.27 ^{+7.24}	2 09 49.165
26	13 57 55.21 ^{230.04}	-12 02 57.3 ^{-1238.5}	16 06.89	+15 50.51 ^{+6.52}	2 13 45.714
27	14 01 45.25 ^{230.77}	12 23 35.8 ^{-1227.0}	16 07.15	15 57.03 ^{+5.78}	2 17 42.265
28	14 05 36.02 ^{231.52}	12 44 02.8 ^{-1215.2}	16 07.41	16 02.81 ^{+5.04}	2 21 38.817
29	14 09 27.54 ^{232.26}	13 04 18.0 ^{-1202.8}	16 07.68	16 07.85 ^{+4.29}	2 25 35.372
30	14 13 19.80 ^{233.02}	13 24 20.8 ^{-1190.0}	16 07.94	16 12.14 ^{+3.54}	2 29 31.930
31	14 17 12.82 ^{233.79}	-13 44 10.8 ^{-1176.9}	16 08.20	+16 15.68 ^{+2.76}	2 33 28.489
Nov. 1	14 21 06.61 ^{234.56}	14 03 47.7 ^{-1163.4}	16 08.46	16 18.44 ^{+1.99}	2 37 25.051
2	14 25 01.17 ^{235.34}	14 23 11.1 ^{-1149.3}	16 08.72	16 20.43 ^{+1.22}	2 41 21.612
3	14 28 56.51 ^{236.13}	14 42 20.4 ^{-1135.0}	16 08.97	16 21.65 ^{+0.42}	2 45 18.171
4	14 32 52.64 ^{236.92}	15 01 15.4 ^{-1120.2}	16 09.23	16 22.07 ^{-0.36}	2 49 14.727
5	14 36 49.56 ^{237.73}	-15 19 55.6 ^{-1105.0}	16 09.48	+16 21.71 ^{-1.17}	2 53 11.282
6	14 40 47.29 ^{238.53}	15 38 20.6 ^{-1089.4}	16 09.73	16 20.54 ^{-1.08}	2 57 07.833
7	14 44 45.82 ^{239.35}	15 56 30.0 ^{-1073.5}	16 09.98	16 18.56 ^{-2.79}	3 01 04.383
8	14 48 45.17 ^{240.18}	16 14 23.5 ^{-1057.2}	16 10.22	16 15.77 ^{-3.62}	3 05 00.932
9	14 52 45.35 ^{241.01}	16 32 00.7 ^{-1040.4}	16 10.46	16 12.15 ^{-4.46}	3 08 57.483
10	14 56 46.36 ^{241.85}	-16 49 21.1 ^{-1023.3}	16 10.69	+16 07.69 ^{-5.29}	3 12 54.039
11	15 00 48.21 ^{242.70}	17 06 24.4 ^{-1005.8}	16 10.93	16 02.40 ^{-6.15}	3 16 50.596
12	15 04 50.91 ^{243.56}	17 23 10.2 ^{-987.9}	16 11.15	15 56.25 ^{-7.00}	3 20 47.156
13	15 08 54.47 ^{244.41}	17 39 38.1 ^{-969.7}	16 11.38	15 49.25 ^{-7.86}	3 24 43.719
14	15 12 58.88 ^{245.28}	17 55 47.8 ^{-951.1}	16 11.59	15 41.39 ^{-8.72}	3 28 40.282
15	15 17 04.16 ^{246.14}	-18 11 38.9 ^{-931.9}	16 11.81	+15 32.67 ^{-9.59}	3 32 36.843
16	15 21 10.30	-18 27 10.8	16 12.02	+15 23.08	3 36 33.403

Date	Mean Equinox of 1935-0		Logarithm of Radius Vector of the Earth	Prec. in Long.	Nut. in Long.	Nut. in R.A.	Transit of First Point of Aries
	Longitude	Latitude					
Oct.	1	186° 52' 34.8"	-0.20	0.000 5163	+37.53	+15.87	+0.954 23 20 57.98
	2	187° 51' 36.2"	0.12	0.000 3896	37.67	15.83	.953 23 17 02.07
	3	188° 50' 39.4"	-0.02	0.000 2622	37.81	15.79	.954 23 13 06.16
	4	189° 49' 44.5"	+0.10	0.000 1344	37.94	15.76	.957 23 09 10.25
	5	190° 48' 51.3"	0.24	0.000 0063	38.08	15.72	.961 23 05 14.35
	6	191° 47' 59.8"	+0.39	9.999 8780	+38.22	+15.68	+0.965 23 01 18.44
	7	192° 47' 10.2"	0.53	.999 7498	38.36	15.65	.967 22 57 22.53
	8	193° 46' 22.2"	0.67	.999 6218	38.49	15.61	.965 22 53 26.63
	9	194° 45' 36.1"	0.78	.999 4941	38.63	15.58	.961 22 49 30.72
	10	195° 44' 51.8"	0.88	.999 3670	38.77	15.55	.954 22 45 34.81
	11	196° 44' 09.3"	+0.94	9.999 2406	+38.91	+15.52	+0.946 22 41 38.90
	12	197° 43' 28.8"	0.97	.999 1150	39.04	15.49	.939 22 37 42.99
	13	198° 42' 50.4"	0.97	.998 9903	39.18	15.45	.934 22 33 47.09
	14	199° 42' 14.0"	0.94	.998 8665	39.32	15.43	.932 22 29 51.18
	15	200° 41' 39.8"	0.88	.998 7435	39.46	15.40	.934 22 25 55.27
	16	201° 41' 07.9"	+0.81	9.998 6214	+39.59	+15.37	+0.937 22 21 59.36
	17	202° 40' 38.3"	0.70	.998 5000	39.73	15.34	.942 22 18 03.46
	18	203° 40' 10.9"	0.58	.998 3793	39.87	15.32	.947 22 14 07.55
	19	204° 39' 45.9"	0.47	.998 2591	40.01	15.29	.950 22 10 11.64
	20	205° 39' 23.1"	0.36	.998 1393	40.14	15.27	.951 22 06 15.73
	21	206° 39' 02.7"	+0.26	9.998 0200	+40.28	+15.25	+0.948 22 02 19.82
	22	207° 38' 44.5"	0.16	.997 9010	40.42	15.23	.944 21 58 23.92
	23	208° 38' 28.5"	0.09	.997 7823	40.56	15.21	.938 21 54 28.01
	24	209° 38' 14.7"	0.04	.997 6639	40.70	15.19	.932 21 50 32.10
	25	210° 38' 03.1"	0.01	.997 5456	40.83	15.17	.924 21 46 36.19
	26	211° 37' 53.6"	+0.01	9.997 4276	+40.97	+15.16	+0.918 21 42 40.28
	27	212° 37' 46.0"	0.03	.997 3097	41.11	15.14	.913 21 38 44.37
	28	213° 37' 40.5"	0.08	.997 1921	41.25	15.13	.910 21 34 48.46
	29	214° 37' 36.9"	0.16	.997 0747	41.38	15.12	.910 21 30 52.56
	30	215° 37' 35.1"	0.26	.996 9575	41.52	15.11	.912 21 26 56.65
Nov.	31	216° 37' 35.1"	+0.37	9.996 8407	+41.66	+15.10	+0.916 21 23 00.74
	1	217° 37' 36.8"	0.50	.996 7244	41.80	15.10	.923 21 19 04.83
	2	218° 37' 40.2"	0.64	.996 6086	41.93	15.09	.928 21 15 08.92
	3	219° 37' 45.1"	0.79	.996 4935	42.07	15.09	.932 21 11 13.01
	4	220° 37' 51.6"	0.93	.996 3793	42.21	15.09	.933 21 07 17.10
	5	221° 37' 59.7"	+1.04	9.996 2662	+42.35	+15.08	+0.932 21 03 21.19
	6	222° 38' 09.2"	1.13	.996 1543	42.48	15.09	.928 20 59 25.28
	7	223° 38' 20.3"	1.19	.996 0438	42.62	15.09	.922 20 55 29.37
	8	224° 38' 32.9"	1.23	.995 9348	42.76	15.09	.916 20 51 33.46
	9	225° 38' 47.1"	1.24	.995 8276	42.90	15.10	.912 20 47 37.55
	10	226° 39' 03.0"	+1.20	9.995 7222	+43.03	+15.11	+0.912 20 43 41.64
	11	227° 39' 20.5"	1.14	.995 6187	43.17	15.11	.914 20 39 45.73
	12	228° 39' 39.7"	1.05	.995 5172	43.31	15.13	.919 20 35 49.82
	13	229° 40' 00.7"	0.95	.995 4176	43.45	15.14	.926 20 31 53.91
	14	230° 40' 23.6"	0.83	.995 3199	43.59	15.15	.934 20 27 58.00
	15	231° 40' 48.3"	+0.71	9.995 2241	+43.72	+15.17	+0.940 20 24 02.09
	16	232° 41' 14.9"	+0.58	9.995 1300	+43.86	+15.18	+0.944 20 20 06.18

Date	Apparent Right Ascension	Apparent Declination	Semi- diameter	Equation of Time Apparent - Mean	Sidereal Time
Nov. 16	^{h m s} 15 21 10.30	^{° ' "} -18 27 10.8	^{' "} 16 12.02	^{m s} +15 23.08	^{h m s} 3 36 33.403
17	15 25 17.31	18 42 23.3	16 12.23	15 12.63	3 40 29.960
18	15 29 25.18	18 57 16.0	16 12.43	15 01.32	3 44 26.515
19	15 33 33.90	19 11 48.5	16 12.63	14 49.16	3 48 23.067
20	15 37 43.46	19 26 00.3	16 12.83	14 36.15	3 52 19.618
21	15 41 53.87	-19 39 51.1	16 13.02	+14 22.30	3 56 16.169
22	15 46 05.11	19 53 20.5	16 13.22	14 07.62	4 00 12.720
23	15 50 17.17	20 06 28.2	16 13.40	13 52.12	4 04 09.272
24	15 54 30.03	20 19 13.7	16 13.59	13 35.81	4 08 05.828
25	15 58 43.69	20 31 36.8	16 13.77	13 18.71	4 12 02.384
26	16 02 58.12	-20 43 37.0	16 13.95	+13 00.84	4 15 58.943
27	16 07 13.31	20 55 13.9	16 14.13	12 42.21	4 19 55.506
28	16 11 29.24	21 06 27.4	16 14.30	12 22.84	4 23 52.069
29	16 15 45.88	21 17 16.9	16 14.48	12 02.75	4 27 48.633
30	16 20 03.22	21 27 42.3	16 14.65	11 41.97	4 31 45.195
Dec. 1	16 24 21.23	-21 37 43.2	16 14.81	+11 20.51	4 35 41.755
2	16 28 39.89	21 47 19.4	16 14.98	10 58.41	4 39 38.313
3	16 32 59.18	21 56 30.4	16 15.14	10 35.68	4 43 34.867
4	16 37 19.07	22 05 16.1	16 15.29	10 12.35	4 47 31.419
5	16 41 39.54	22 13 36.3	16 15.44	9 48.44	4 51 27.971
6	16 46 00.57	-22 21 30.6	16 15.59	+ 9 23.97	4 55 24.523
7	16 50 22.13	22 28 58.8	16 15.73	8 58.96	4 59 21.079
8	16 54 44.21	22 36 00.8	16 15.86	8 33.43	5 03 17.638
9	16 59 06.78	22 42 36.2	16 15.99	8 07.42	5 07 14.200
10	17 03 29.82	22 48 44.9	16 16.12	7 40.94	5 11 10.763
11	17 07 53.31	-22 54 26.7	16 16.23	+ 7 14.02	5 15 07.329
12	17 12 17.21	22 59 41.4	16 16.35	6 46.67	5 19 03.893
13	17 16 41.51	23 04 28.8	16 16.45	6 18.93	5 23 00.456
14	17 21 06.18	23 08 48.8	16 16.55	5 50.82	5 26 57.015
15	17 25 31.19	23 12 41.1	16 16.64	5 22.37	5 30 53.572
16	17 29 56.51	-23 16 05.7	16 16.73	+ 4 53.61	5 34 50.128
17	17 34 22.11	23 19 02.5	16 16.82	4 24.57	5 38 46.680
18	17 38 47.95	23 21 31.2	16 16.90	3 55.28	5 42 43.232
19	17 43 14.01	23 23 31.9	16 16.97	3 25.78	5 46 39.786
20	17 47 40.25	23 25 04.4	16 17.04	2 56.10	5 50 36.339
21	17 52 06.64	-23 26 08.7	16 17.10	+ 2 26.27	5 54 32.894
22	17 56 33.13	23 26 44.8	16 17.16	1 56.34	5 58 29.452
23	18 00 59.70	23 26 52.5	16 17.22	1 26.33	6 02 26.012
24	18 05 26.30	23 26 31.9	16 17.27	0 56.28	6 06 22.575
25	18 09 52.90	23 25 42.9	16 17.32	+ 0 26.24	6 10 19.139
26	18 14 19.46	-23 24 25.7	16 17.36	- 0 03.76	6 14 15.703
27	18 18 45.94	23 22 40.3	16 17.40	0 33.68	6 18 12.267
28	18 23 12.30	23 20 26.6	16 17.44	1 03.48	6 22 08.829
29	18 27 38.50	23 17 44.8	16 17.48	1 33.12	6 26 05.388
30	18 32 04.51	23 14 34.9	16 17.51	2 02.57	6 30 01.945
31	18 36 30.28	-23 10 57.2	16 17.53	- 2 31.79	6 33 58.498
32	18 40 55.79	-23 06 51.6	16 17.55	- 3 00.73	6 37 55.050

Date	Mean Equinox of 1935-0		Logarithm of Radius Vector of the Earth	Prec. in Long.	Nut. in Long.	Nut. in R.A.	Transit of First Point of Aries
	Longitude	Latitude					
Nov. 16	232° 41' 14.9 ^{3628.4}	+0° 58'	9.995 1300 - 925	+43.86	+15.18	+0.944	20 20 06.18
17	233 41 43.3 ^{3630.3}	0.46	.995 0375 909	44.00	15.20	.946	20 16 10.27
18	234 42 13.6 ^{3632.1}	0.36	.994 9466 894	44.14	15.22	.945	20 12 14.36
19	235 42 45.7 ^{3633.9}	0.27	.994 8572 879	44.27	15.24	.942	20 08 18.45
20	236 43 19.6 ^{3635.6}	0.21	.994 7693 867	44.41	15.27	.938	20 04 22.54
21	237 43 55.2 ^{3637.4}	+0.18	9.994 6826 - 853	+44.55	+15.29	+0.933	20 00 26.63
22	238 44 32.6 ^{3639.0}	0.17	.994 5973 840	44.69	15.32	.929	19 56 30.72
23	239 45 11.6 ^{3640.5}	0.19	.994 5133 829	44.82	15.34	.926	19 52 34.80
24	240 45 52.1 ^{3642.1}	0.23	.994 4304 816	44.96	15.37	.926	19 48 38.89
25	241 46 34.2 ^{3643.5}	0.29	.994 3488 806	45.10	15.40	.927	19 44 42.98
26	242 47 17.7 ^{3644.9}	+0.38	9.994 2682 - 794	+45.24	+15.44	+0.931	19 40 47.07
27	243 48 02.6 ^{3646.1}	0.50	.994 1888 782	45.37	15.47	.938	19 36 51.16
28	244 48 48.7 ^{3647.3}	0.62	.994 1106 770	45.51	15.50	.946	19 32 55.25
29	245 49 36.0 ^{3648.4}	0.76	.994 0336 758	45.65	15.54	.954	19 28 59.34
30	246 50 24.4 ^{3649.4}	0.90	.993 9578 743	45.79	15.57	.961	19 25 03.42
Dec. 1	247 51 13.8 ^{3650.3}	+1.03	9.993 8835 - 728	+45.92	+15.61	+0.966	19 21 07.51
2	248 52 04.1 ^{3651.1}	1.15	.993 8107 711	46.06	15.65	.968	19 17 11.60
3	249 52 55.2 ^{3652.0}	1.24	.993 7396 692	46.20	15.69	.967	19 13 15.69
4	250 53 47.2 ^{3652.8}	1.31	.993 6704 672	46.34	15.73	.964	19 09 19.78
5	251 54 40.0 ^{3653.5}	1.35	.993 6032 650	46.48	15.77	.960	19 05 23.86
6	252 55 33.5 ^{3654.3}	+1.35	9.993 5382 - 626	+46.61	+15.82	+0.957	19 01 27.95
7	253 56 27.8 ^{3655.1}	1.32	.993 4756 602	46.75	15.86	.958	18 57 32.04
8	254 57 22.9 ^{3655.9}	1.26	.993 4154 576	46.89	15.91	.961	18 53 36.13
9	255 58 18.8 ^{3656.8}	1.17	.993 3578 549	47.03	15.95	.968	18 49 40.22
10	256 59 15.6 ^{3657.7}	1.05	.993 3029 523	47.16	16.00	.976	18 45 44.30
11	258 00 13.3 ^{3658.5}	+0.93	9.993 2506 - 495	+47.30	+16.05	+0.986	18 41 48.39
12	259 01 11.8 ^{3659.5}	0.79	.993 2011 469	47.44	16.10	0.995	18 37 52.48
13	260 02 11.3 ^{3660.5}	0.65	.993 1542 444	47.58	16.14	1.002	18 33 56.57
14	261 03 11.8 ^{3661.5}	0.53	.993 1098 418	47.71	16.19	1.006	18 30 00.65
15	262 04 13.3 ^{3662.4}	0.41	.993 0680 394	47.85	16.24	1.008	18 26 04.74
16	263 05 15.7 ^{3663.3}	+0.31	9.993 0286 - 371	+47.99	+16.29	+1.008	18 22 08.83
17	264 06 19.0 ^{3664.3}	0.23	.992 9915 349	48.13	16.34	1.005	18 18 12.92
18	265 07 23.3 ^{3665.1}	0.18	.992 9566 327	48.26	16.40	1.002	18 14 17.00
19	266 08 28.4 ^{3666.0}	0.15	.992 9239 306	48.40	16.45	1.000	18 10 21.09
20	267 09 34.4 ^{3666.7}	0.16	.992 8933 287	48.54	16.50	0.998	18 06 25.18
21	268 10 41.1 ^{3667.5}	+0.19	9.992 8646 - 267	+48.68	+16.55	+0.998	18 02 29.26
22	269 11 48.6 ^{3668.2}	0.24	.992 8379 249	48.81	16.60	1.000	17 58 33.35
23	270 12 56.8 ^{3668.7}	0.33	.992 8130 232	48.95	16.65	.005	17 54 37.44
24	271 14 05.5 ^{3669.3}	0.44	.992 7898 215	49.09	16.71	.012	17 50 41.53
25	272 15 14.8 ^{3669.6}	0.56	.992 7683 199	49.23	16.76	.021	17 46 45.61
26	273 16 24.4 ^{3670.0}	+0.69	9.992 7484 - 183	+49.37	+16.81	+1.030	17 42 49.70
27	274 17 34.4 ^{3670.2}	0.82	.992 7301 167	49.50	16.86	.038	17 38 53.79
28	275 18 44.6 ^{3670.2}	0.95	.992 7134 150	49.64	16.91	.045	17 34 57.88
29	276 19 54.8 ^{3670.2}	1.07	.992 6984 132	49.78	16.96	.049	17 31 01.96
30	277 21 05.0 ^{3670.2}	1.16	.992 6852 114	49.92	17.01	.050	17 27 06.05
31	278 22 15.2 ^{3669.9}	+1.22	9.992 6738 - 93	+50.05	+17.06	+1.048	17 23 10.14
32	279 23 25.1	+1.27	9.992 6645	+50.19	+17.11	+1.045	17 19 14.23

AT TRANSIT AT GREENWICH

Date	G.M.T.	Apparent Right Ascension	S.D. in Sidereal Time	Apparent Declination	Semi- diameter in Arc
Jan. 1	^h 12 ^m 03 ^s 20.84 +28.48	^h 18 ^m 44 ^s 11.87 265.12	^m 11 ^s 04	-23 03 36.9 + 294.0	16 17.50
2	12 03 49.32 28.16	18 48 36.99 264.79	11 00	22 58 42.9 321.4	16 17.50
3	12 04 17.48 27.80	18 53 01.78 264.44	10 95	22 53 21.5 348.9	16 17.50
4	12 04 45.28 27.42	18 57 26.22 264.05	10 90	22 47 32.6 376.1	16 17.49
5	12 05 12.70 26.99	19 01 50.27 263.62	10 85	22 41 16.5 403.1	16 17.48
6	12 05 39.69 +26.53	19 06 13.89 263.16	10 79	-22 34 33.4 + 429.9	16 17.47
7	12 06 06.22 26.04	19 10 37.05 262.67	10 73	22 27 23.5 456.5	16 17.45
8	12 06 32.26 25.51	19 14 59.72 262.15	10 66	22 19 47.0 482.8	16 17.43
9	12 06 57.77 24.97	19 19 21.87 261.59	10 59	22 11 44.2 508.9	16 17.41
10	12 07 22.74 24.38	19 23 43.46 261.01	10 52	22 03 15.3 534.6	16 17.38
11	12 07 47.12 +23.79	19 28 04.47 260.41	10 44	-21 54 20.7 + 560.2	16 17.35
12	12 08 10.91 23.17	19 32 24.88 259.79	10 36	21 45 00.5 585.5	16 17.31
13	12 08 34.08 22.52	19 36 44.67 259.14	10 28	21 35 15.0 610.4	16 17.26
14	12 08 56.60 21.86	19 41 03.81 258.48	10 19	21 25 04.6 635.1	16 17.22
15	12 09 18.46 21.18	19 45 22.29 257.80	10 10	21 14 29.5 659.5	16 17.16
16	12 09 39.64 +20.49	19 49 40.09 257.10	10 01	-21 03 30.0 + 683.7	16 17.10
17	12 10 00.13 19.79	19 53 57.19 256.40	09 92	20 52 06.3 707.4	16 17.03
18	12 10 19.92 19.07	19 58 13.59 255.68	09 82	20 40 18.9 730.9	16 16.96
19	12 10 38.99 18.34	20 02 29.27 254.95	09 72	20 28 08.0 754.0	16 16.88
20	12 10 57.33 17.60	20 06 44.22 254.20	09 62	20 15 34.0 776.9	16 16.80
21	12 11 14.93 +16.85	20 10 58.42 253.45	09 52	-20 02 37.1 + 799.4	16 16.71
22	12 11 31.78 16.09	20 15 11.87 252.69	09 41	19 49 17.7 821.5	16 16.61
23	12 11 47.87 15.32	20 19 24.56 251.93	09 30	19 35 36.2 843.4	16 16.51
24	12 12 03.19 14.55	20 23 36.49 251.15	09 20	19 21 32.8 864.8	16 16.40
25	12 12 17.74 13.78	20 27 47.64 250.37	09 09	19 07 08.0 885.9	16 16.29
26	12 12 31.52 +12.99	20 31 58.01 249.58	08 98	-18 52 22.1 + 906.7	16 16.17
27	12 12 44.51 12.20	20 36 07.59 248.79	08 86	18 37 15.4 927.0	16 16.04
28	12 12 56.71 11.41	20 40 16.38 248.00	08 75	18 21 48.4 947.1	16 15.91
29	12 13 08.12 10.61	20 44 24.38 247.20	08 64	18 06 01.3 966.6	16 15.78
30	12 13 18.73 9.81	20 48 31.58 246.39	08 52	17 49 54.7 985.8	16 15.64
31	12 13 28.54 +9.00	20 52 37.97 245.58	08 41	-17 33 28.9 + 1004.6	16 15.50
Feb. 1	12 13 37.54 8.20	20 56 43.55 244.78	08 29	17 16 44.3 1022.9	16 15.36
2	12 13 45.74 7.38	21 00 48.33 243.95	08 18	16 59 41.4 1040.8	16 15.21
3	12 13 53.12 6.56	21 04 52.28 243.14	08 06	16 42 20.6 1058.3	16 15.06
4	12 13 59.68 5.74	21 08 55.42 242.31	07 95	16 24 42.3 1075.3	16 14.91
5	12 14 05.42 +4.92	21 12 57.73 241.49	07 83	-16 06 47.0 + 1092.0	16 14.76
6	12 14 10.34 4.10	21 16 59.22 240.66	07 72	15 48 35.0 1108.1	16 14.60
7	12 14 14.44 3.27	21 20 59.88 239.84	07 60	15 30 06.9 1123.8	16 14.44
8	12 14 17.71 2.46	21 24 59.72 239.02	07 49	15 11 23.1 1139.1	16 14.28
9	12 14 20.17 1.65	21 28 58.74 238.22	07 38	14 52 24.0 1153.9	16 14.11
10	12 14 21.82 +0.86	21 32 56.96 237.41	07 27	-14 33 10.1 + 1168.4	16 13.94
11	12 14 22.68 +0.06	21 36 54.37 236.61	07 16	14 13 41.7 1182.4	16 13.77
12	12 14 22.74 -0.73	21 40 50.98 235.83	07 05	13 53 59.3 1196.0	16 13.59
13	12 14 22.01 1.49	21 44 46.81 235.07	06 94	13 34 03.3 1209.3	16 13.40
14	12 14 20.52 2.24	21 48 41.88 234.30	06 83	13 13 54.0 1222.1	16 13.22
15	12 14 18.28 -2.99	21 52 36.18 233.56	06 73	-12 53 31.9 + 1234.5	16 13.03
16	12 14 15.29	21 56 29.74	06 62	-12 32 57.4	16 12.83

AT TRANSIT AT GREENWICH

Date	G.M.T.	Apparent Right Ascension	S.D. in Sidereal Time	Apparent Declination	Semi- diameter in Arc
Feb. 16	^h 12 ^m 14 ^s 15.29 — 3.71	^h 21 ^m 56 ^s 29.74 232.83	^m 06.62	— 12 32 57.4 +1246.6	16 12.83
17	12 14 11.58 4.42	22 00 22.57 232.12	06.52	12 12 10.8 1258.1	16 12.63
18	12 14 07.16 5.12	22 04 14.69 231.42	06.42	11 51 12.7 1269.4	16 12.42
19	12 14 02.04 5.79	22 08 06.11 230.75	06.32	11 30 03.3 1280.3	16 12.22
20	12 13 56.25 6.46	22 11 56.86 230.08	06.22	11 08 43.0 1290.8	16 12.00
21	12 13 49.79 — 7.10	22 15 46.94 229.43	06.13	— 10 47 12.2 +1300.8	16 11.78
22	12 13 42.69 7.73	22 19 36.37 228.81	06.03	10 25 31.4 1310.5	16 11.56
23	12 13 34.96 8.34	22 23 25.18 228.19	05.94	10 03 40.9 1319.8	16 11.33
24	12 13 26.62 8.93	22 27 13.37 227.60	05.85	9 41 41.1 1328.7	16 11.10
25	12 13 17.69 9.50	22 31 00.97 227.03	05.76	9 19 32.4 1337.2	16 10.87
26	12 13 08.19 — 10.05	22 34 48.00 226.48	05.68	— 8 57 15.2 +1345.3	16 10.63
27	12 12 58.14 10.59	22 38 34.48 225.93	05.60	8 34 49.9 1353.0	16 10.40
28	12 12 47.55 11.11	22 42 20.41 225.41	05.52	8 12 16.9 1360.3	16 10.15
Mar. 1	12 12 36.44 11.61	22 46 05.82 224.91	05.44	7 49 36.6 1367.2	16 09.91
2	12 12 24.83 12.11	22 49 50.73 224.42	05.36	7 26 49.4 1373.7	16 09.67
3	12 12 12.72 — 12.58	22 53 35.15 223.94	05.29	— 7 03 55.7 +1379.7	16 09.42
4	12 12 00.14 13.04	22 57 19.09 223.47	05.22	6 40 56.0 1385.3	16 09.17
5	12 11 47.10 13.49	23 01 02.56 223.03	05.16	6 17 50.7 1390.4	16 08.93
6	12 11 33.61 13.92	23 04 45.59 222.59	05.09	5 54 40.3 1395.2	16 08.68
7	12 11 19.69 14.34	23 08 28.18 222.18	05.03	5 31 25.1 1399.6	16 08.43
8	12 11 05.35 — 14.73	23 12 10.36 221.78	04.97	— 5 08 05.5 +1403.5	16 08.18
9	12 10 50.62 15.13	23 15 52.14 221.39	04.92	4 44 42.0 1407.0	16 07.93
10	12 10 35.49 15.49	23 19 33.53 221.02	04.87	4 21 15.0 1410.1	16 07.68
11	12 10 20.00 15.83	23 23 14.55 220.68	04.82	3 57 44.9 1412.9	16 07.42
12	12 10 04.17 16.16	23 26 55.23 220.35	04.77	3 34 12.0 1415.3	16 07.17
13	12 09 48.01 — 16.46	23 30 35.58 220.05	04.73	— 3 10 36.7 +1417.4	16 06.91
14	12 09 31.55 16.74	23 34 15.63 219.76	04.69	2 46 59.3 1419.1	16 06.66
15	12 09 14.81 17.00	23 37 55.39 219.51	04.65	2 23 20.2 1420.4	16 06.40
16	12 08 57.81 17.24	23 41 34.90 219.27	04.61	1 59 39.8 1421.3	16 06.13
17	12 08 40.57 17.45	23 45 14.17 219.05	04.58	1 35 58.5 1422.0	16 05.87
18	12 08 23.12 — 17.64	23 48 53.22 218.86	04.55	— 1 12 16.5 +1422.2	16 05.60
19	12 08 05.48 17.81	23 52 32.08 218.69	04.52	0 48 34.3 1422.2	16 05.33
20	12 07 47.67 17.96	23 56 10.77 218.55	04.50	0 24 52.1 1421.9	16 05.06
21	12 07 29.71 18.08	23 59 49.32 218.42	04.48	— 0 01 10.2 1421.0	16 04.79
22	12 07 11.63 18.17	0 03 27.74 218.33	04.46	+ 0 22 30.8 1420.0	16 04.51
23	12 06 53.46 — 18.25	0 07 06.07 218.26	04.45	+ 0 46 10.8 +1418.6	16 04.24
24	12 06 35.21 18.30	0 10 44.33 218.20	04.44	1 09 49.4 1416.8	16 03.96
25	12 06 16.91 18.33	0 14 22.53 218.17	04.43	1 33 26.2 1414.8	16 03.68
26	12 05 58.58 18.34	0 18 00.70 218.17	04.43	1 57 01.0 1412.3	16 03.40
27	12 05 40.24 18.32	0 21 38.87 218.19	04.42	2 20 33.3 1409.4	16 03.11
28	12 05 21.92 — 18.28	0 25 17.06 218.22	04.42	+ 2 44 02.7 +1406.4	16 02.83
29	12 05 03.64 18.23	0 28 55.28 218.27	04.43	3 07 29.1 1402.8	16 02.55
30	12 04 45.41 18.15	0 32 33.55 218.35	04.43	3 30 51.9 1398.9	16 02.27
31	12 04 27.26 18.06	0 36 11.90 218.44	04.44	3 54 10.8 1394.7	16 01.98
Apr. 1	12 04 09.20 17.96	0 39 50.34 218.55	04.46	4 17 25.5 1390.0	16 01.70
2	12 03 51.24 — 17.84	0 43 28.89 218.66	04.47	+ 4 40 35.5 +1385.0	16 01.42
3	12 03 33.40	0 47 07.55	04.49	+ 5 03 40.5	16 01.15

SUN, 1935

AT TRANSIT AT GREENWICH

Date	G.M.T.	Apparent Right Ascension	S.D. in Sidereal Time	Apparent Declination	Semi- diameter in Arc
Apr. 1	^h 12 ^m 04 ^s 09.20 -17.96	^h 0 39 ^m 50 ^s 34 218.55	^m 1 04.46	+ 4 17 25.5 +1390.0	16 01.70
2	12 03 51.24 17.84	0 43 28.89 218.66	1 04.47	4 40 35.5 1385.0	16 01.42
3	12 03 33.40 17.70	0 47 07.55 218.80	1 04.49	5 03 40.5 1379.6	16 01.15
4	12 03 15.70 17.56	0 50 46.35 218.95	1 04.51	5 26 40.1 1373.8	16 00.87
5	12 02 58.14 17.39	0 54 25.30 219.12	1 04.53	5 49 33.9 1367.7	16 00.60
6	12 02 40.75 -17.22	0 58 04.42 219.29	1 04.56	+ 6 12 21.6 +1361.1	16 00.33
7	12 02 23.53 17.02	1 01 43.71 219.49	1 04.59	6 35 02.7 1354.3	16 00.05
8	12 02 06.51 16.81	1 05 23.20 219.70	1 04.62	6 57 37.0 1347.0	15 59.78
9	12 01 49.70 16.58	1 09 02.90 219.92	1 04.66	7 20 04.0 1339.5	15 59.52
10	12 01 33.12 16.34	1 12 42.82 220.17	1 04.70	7 42 23.5 1331.7	15 59.25
11	12 01 16.78 -16.08	1 16 22.99 220.43	1 04.74	+ 8 04 35.2 +1323.4	15 58.98
12	12 01 00.70 15.80	1 20 03.42 220.72	1 04.78	8 26 38.6 1314.9	15 58.72
13	12 00 44.90 15.50	1 23 44.14 221.01	1 04.82	8 48 33.5 1306.0	15 58.45
14	12 00 29.40 15.19	1 27 25.15 221.32	1 04.87	9 10 19.5 1296.9	15 58.19
15	12 00 14.21 14.85	1 31 06.47 221.66	1 04.92	9 31 56.4 1287.3	15 57.92
16	11 59 59.36 -14.51	1 34 48.13 222.00	1 04.97	+ 9 53 23.7 +1277.5	15 57.66
17	11 59 44.85 14.14	1 38 30.13 222.37	1 05.03	10 14 41.2 1267.4	15 57.39
18	11 59 30.71 13.76	1 42 12.50 222.76	1 05.08	10 35 48.6 1257.0	15 57.13
19	11 59 16.95 13.36	1 45 55.26 223.17	1 05.14	10 56 45.6 1246.2	15 56.87
20	11 59 03.59 12.93	1 49 38.43 223.58	1 05.20	11 17 31.8 1235.2	15 56.60
21	11 58 50.66 -12.50	1 53 22.01 224.02	1 05.26	+11 38 07.0 +1223.7	15 56.34
22	11 58 38.16 12.04	1 57 06.03 224.48	1 05.33	11 58 30.7 1212.1	15 56.08
23	11 58 26.12 11.58	2 00 50.51 224.94	1 05.39	12 18 42.8 1200.1	15 55.82
24	11 58 14.54 11.09	2 04 35.45 225.43	1 05.46	12 38 42.9 1187.7	15 55.56
25	11 58 03.45 10.60	2 08 20.88 225.93	1 05.53	12 58 30.6 1175.1	15 55.30
26	11 57 52.85 -10.09	2 12 06.81 226.44	1 05.60	+13 18 05.7 +1162.0	15 55.04
27	11 57 42.76 9.57	2 15 53.25 226.96	1 05.67	13 37 27.7 1148.7	15 54.78
28	11 57 33.19 9.05	2 19 40.21 227.48	1 05.74	13 56 36.4 1135.0	15 54.53
29	11 57 24.14 8.51	2 23 27.69 228.02	1 05.82	14 15 31.4 1121.0	15 54.28
30	11 57 15.63 7.98	2 27 15.71 228.56	1 05.89	14 34 12.4 1106.6	15 54.03
May 1	11 57 07.65 - 7.44	2 31 04.27 229.10	1 05.97	+14 52 39.0 +1091.9	15 53.79
2	11 57 00.21 6.89	2 34 53.37 229.64	1 06.04	15 10 50.9 1076.8	15 53.55
3	11 56 53.32 6.35	2 38 43.01 230.18	1 06.12	15 28 47.7 1061.5	15 53.31
4	11 56 46.97 5.81	2 42 33.19 230.74	1 06.20	15 46 29.2 1045.7	15 53.08
5	11 56 41.16 5.25	2 46 23.93 231.28	1 06.28	16 03 54.9 1029.7	15 52.85
6	11 56 35.91 - 4.71	2 50 15.21 231.84	1 06.36	+16 21 04.6 +1013.4	15 52.62
7	11 56 31.20 4.16	2 54 07.05 232.39	1 06.44	16 37 58.0 996.6	15 52.40
8	11 56 27.04 3.60	2 57 59.44 232.94	1 06.53	16 54 34.6 979.8	15 52.18
9	11 56 23.44 3.05	3 01 52.38 233.50	1 06.61	17 10 54.4 962.5	15 51.97
10	11 56 20.39 2.50	3 05 45.88 234.05	1 06.69	17 26 56.9 944.9	15 51.76
11	11 56 17.89 - 1.94	3 09 39.93 234.61	1 06.77	+17 42 41.8 + 927.1	15 51.55
12	11 56 15.95 1.38	3 13 34.54 235.17	1 06.86	17 58 08.9 909.0	15 51.34
13	11 56 14.57 0.82	3 17 29.71 235.73	1 06.94	18 13 17.9 890.6	15 51.14
14	11 56 13.75 - 0.26	3 21 25.44 236.30	1 07.02	18 28 08.5 871.9	15 50.94
15	11 56 13.49 + 0.29	3 25 21.74 236.85	1 07.10	18 42 40.4 853.1	15 50.74
16	11 56 13.78 + 0.85	3 29 18.59 237.41	1 07.18	+18 56 53.5 + 833.8	15 50.54
17	11 56 14.63	3 33 16.00	1 07.26	+19 10 47.3	15 50.34

AT TRANSIT AT GREENWICH

Date	G.M.T.	Apparent Right Ascension	S.D. in Sidereal Time	Apparent Declination	Semi- diameter in Arc
May	17 11 ^h 56 ^m 14.63 ^s + 1.41	3 33 16.00 237.97	I 07.26	+19 10 47.3 + 814.4	15 50.34
	18 11 56 16.04 1.97	3 37 13.97 238.53	I 07.34	19 24 21.7 794.7	15 50.15
	19 11 56 18.01 2.53	3 41 12.50 239.09	I 07.42	19 37 36.4 774.8	15 49.96
	20 11 56 20.54 3.08	3 45 11.59 239.65	I 07.50	19 50 31.2 754.5	15 49.77
	21 11 56 23.62 3.64	3 49 11.24 240.20	I 07.58	20 03 05.7 734.1	15 49.58
	22 11 56 27.26 + 4.18	3 53 11.44 240.75	I 07.65	+20 15 19.8 + 713.4	15 49.40
	23 11 56 31.44 4.73	3 57 12.19 241.30	I 07.73	20 27 13.2 692.4	15 49.21
	24 11 56 36.17 5.26	4 01 13.49 241.84	I 07.80	20 38 45.6 671.3	15 49.03
	25 11 56 41.43 5.79	4 05 15.33 242.36	I 07.87	20 49 56.9 649.8	15 48.86
	26 11 56 47.22 6.31	4 09 17.69 242.88	I 07.94	21 00 46.7 628.1	15 48.69
	27 11 56 53.53 + 6.81	4 13 20.57 243.39	I 08.01	+21 11 14.8 + 606.2	15 48.52
	28 11 57 00.34 7.29	4 17 23.96 243.87	I 08.08	21 21 21.0 + 584.0	15 48.35
	29 11 57 07.63 7.76	4 21 27.83 244.33	I 08.14	21 31 05.0 561.7	15 48.19
	30 11 57 15.39 8.21	4 25 32.16 244.80	I 08.20	21 40 26.7 539.1	15 48.04
	31 11 57 23.60 8.65	4 29 36.96 245.22	I 08.26	21 49 25.8 516.4	15 47.89
June	1 11 57 32.25 + 9.05	4 33 42.18 245.64	I 08.32	+21 58 02.2 + 493.3	15 47.74
	2 11 57 41.30 9.44	4 37 47.82 246.02	I 08.38	22 06 15.5 470.2	15 47.60
	3 11 57 50.74 9.81	4 41 53.84 246.40	I 08.43	22 14 05.7 447.0	15 47.47
	4 11 58 00.55 10.16	4 46 00.24 246.75	I 08.48	22 21 32.7 423.4	15 47.34
	5 11 58 10.71 10.49	4 50 06.99 247.07	I 08.53	22 28 36.1 399.8	15 47.22
	6 11 58 21.20 +10.79	4 54 14.06 247.38	I 08.58	+22 35 15.9 + 376.1	15 47.10
	7 11 58 31.99 11.08	4 58 21.44 247.67	I 08.63	22 41 32.0 352.2	15 46.98
	8 11 58 43.07 11.35	5 02 29.11 247.93	I 08.67	22 47 24.2 328.2	15 46.87
	9 11 58 54.42 11.59	5 06 37.04 248.18	I 08.71	22 52 52.4 304.1	15 46.77
	10 11 59 06.01 11.81	5 10 45.22 248.40	I 08.74	22 57 56.5 279.8	15 46.66
	11 11 59 17.82 +12.02	5 14 53.62 248.61	I 08.77	+23 02 36.3 + 255.5	15 46.57
	12 11 59 29.84 12.20	5 19 02.23 248.79	I 08.80	23 06 51.8 231.1	15 46.47
	13 11 59 42.04 12.36	5 23 11.02 248.95	I 08.83	23 10 42.9 206.7	15 46.38
	14 11 59 54.40 12.50	5 27 19.97 249.11	I 08.85	23 14 09.6 182.1	15 46.29
	15 12 00 06.90 12.63	5 31 29.08 249.22	I 08.87	23 17 11.7 157.5	15 46.21
	16 12 00 19.53 +12.74	5 35 38.30 249.33	I 08.89	+23 19 49.2 + 132.9	15 46.12
	17 12 00 32.27 12.83	5 39 47.63 249.42	I 08.90	23 22 02.1 108.2	15 46.05
	18 12 00 45.10 12.90	5 43 57.05 249.49	I 08.91	23 23 50.3 83.4	15 45.97
	19 12 00 58.00 12.95	5 48 06.54 249.54	I 08.92	23 25 13.7 58.6	15 45.90
	20 12 01 10.95 12.98	5 52 16.08 249.58	I 08.92	23 26 12.3 33.8	15 45.83
	21 12 01 23.93 +12.99	5 56 25.66 249.58	I 08.92	+23 26 46.1 + 9.0	15 45.76
	22 12 01 36.92 12.95	6 00 35.24 249.58	I 08.92	23 26 55.1 - 15.8	15 45.70
	23 12 01 49.90 12.95	6 04 44.82 249.55	I 08.91	23 26 39.3 40.7	15 45.64
	24 12 02 02.85 12.89	6 08 54.37 249.48	I 08.90	23 25 58.6 65.5	15 45.58
	25 12 02 15.74 12.81	6 13 03.85 249.40	I 08.89	23 24 53.1 90.3	15 45.53
	26 12 02 28.55 +12.70	6 17 13.25 249.29	I 08.87	+23 23 22.8 - 114.9	15 45.49
	27 12 02 41.25 12.56	6 21 22.54 249.16	I 08.85	23 21 27.9 139.7	15 45.41
	28 12 02 53.81 12.40	6 25 31.70 248.98	I 08.83	23 19 08.2 164.3	15 45.41
	29 12 03 06.21 12.21	6 29 40.68 248.80	I 08.81	23 16 23.9 188.9	15 45.39
	30 12 03 18.42 11.99	6 33 49.48 248.58	I 08.78	23 13 15.0 213.3	15 45.36
July	1 12 03 30.41 +11.74	6 37 58.06 248.34	I 08.75	+23 09 41.7 - 237.6	15 45.35
	2 12 03 42.15	6 42 06.40	I 08.71	+23 05 44.1	15 45.34

SUN, 1935

AT TRANSIT AT GREENWICH

Date	G.M.T.	Apparent Right Ascension	S.D. in Sidereal Time	Apparent Declination	Semi- diameter in Arc
July	^{h m s} 1 12 03 30.41 +11.74	^{h m s} 6 37 58.06 248.34	^{m s} 1 08.75	^{° ' "} +23 09 41.7 - 237.6	^{' "} 15 45.35
	2 12 03 42.15 11.48	6 42 06.40 248.07	1 08.71	23 05 44.1 261.8	15 45.34
	3 12 03 53.63 11.19	6 46 14.47 247.77	1 08.67	23 01 22.3 286.0	15 45.33
	4 12 04 04.82 10.87	6 50 22.24 247.46	1 08.63	22 56 36.3 309.9	15 45.33
	5 12 04 15.69 10.53	6 54 29.70 247.12	1 08.59	22 51 26.4 333.8	15 45.33
	6 12 04 26.22 +10.17	6 58 36.82 246.76	1 08.54	+22 45 52.6 - 357.5	15 45.34
	7 12 04 36.39 9.79	7 02 43.58 246.37	1 08.49	22 39 55.1 381.0	15 45.36
	8 12 04 46.18 9.39	7 06 49.95 245.98	1 08.44	22 33 34.1 404.4	15 45.38
	9 12 04 55.57 8.98	7 10 55.93 245.56	1 08.39	22 26 49.7 427.6	15 45.40
	10 12 05 04.55 8.54	7 15 01.49 245.11	1 08.33	22 19 42.1 450.6	15 45.43
	11 12 05 13.09 +8.09	7 19 06.60 244.67	1 08.27	+22 12 11.5 - 473.5	15 45.47
	12 12 05 21.18 7.62	7 23 11.27 244.21	1 08.21	22 04 18.0 496.1	15 45.50
	13 12 05 28.80 7.15	7 27 15.48 243.72	1 08.15	21 56 01.9 518.7	15 45.54
	14 12 05 35.95 6.66	7 31 19.20 243.24	1 08.08	21 47 23.2 540.9	15 45.59
	15 12 05 42.61 6.17	7 35 22.44 242.74	1 08.01	21 38 22.3 563.1	15 45.63
	16 12 05 48.78 +5.67	7 39 25.18 242.24	1 07.94	+21 28 59.2 - 585.0	15 45.68
	17 12 05 54.45 5.15	7 43 27.42 241.73	1 07.87	21 19 14.2 606.7	15 45.73
	18 12 05 59.60 4.64	7 47 29.15 241.21	1 07.80	21 09 07.5 628.2	15 45.79
	19 12 06 04.24 4.11	7 51 30.36 240.68	1 07.72	20 58 39.3 649.5	15 45.85
	20 12 06 08.35 3.58	7 55 31.04 240.15	1 07.64	20 47 49.8 670.7	15 45.91
	21 12 06 11.93 +3.05	7 59 31.19 239.61	1 07.56	+20 36 39.1 - 691.5	15 45.98
	22 12 06 14.98 2.50	8 03 30.80 239.06	1 07.48	20 25 07.6 712.2	15 46.04
	23 12 06 17.48 1.94	8 07 29.86 238.51	1 07.40	20 13 15.4 732.6	15 46.12
	24 12 06 19.42 1.38	8 11 28.37 237.94	1 07.32	20 01 02.8 752.7	15 46.20
	25 12 06 20.80 0.81	8 15 26.31 237.37	1 07.24	19 48 30.1 772.5	15 46.28
	26 12 06 21.61 +0.24	8 19 23.68 236.79	1 07.15	+19 35 37.6 - 792.1	15 46.37
	27 12 06 21.85 -0.36	8 23 20.47 236.20	1 07.07	19 22 25.5 811.5	15 46.46
	28 12 06 21.49 0.95	8 27 16.67 235.60	1 06.98	19 08 54.0 830.4	15 46.56
	29 12 06 20.54 1.55	8 31 12.27 235.00	1 06.90	18 55 03.6 849.1	15 46.66
	30 12 06 18.99 2.15	8 35 07.27 234.40	1 06.81	18 40 54.5 867.6	15 46.77
	31 12 06 16.84 -2.77	8 39 01.67 233.78	1 06.72	+18 26 26.9 - 885.7	15 46.88
Aug.	1 12 06 14.07 3.38	8 42 55.45 233.17	1 06.64	18 11 41.2 903.5	15 47.00
	2 12 06 10.69 3.99	8 46 48.62 232.55	1 06.55	17 56 37.7 921.0	15 47.13
	3 12 06 06.70 4.62	8 50 41.17 231.93	1 06.46	17 41 16.7 938.2	15 47.26
	4 12 06 02.08 5.23	8 54 33.10 231.31	1 06.38	17 25 38.5 955.1	15 47.39
	5 12 05 56.85 -5.84	8 58 24.41 230.70	1 06.29	+17 09 43.4 - 971.7	15 47.53
	6 12 05 51.01 6.46	9 02 15.11 230.08	1 06.20	16 53 31.7 987.9	15 47.67
	7 12 05 44.55 7.07	9 06 05.19 229.47	1 06.12	16 37 03.8 1003.9	15 47.82
	8 12 05 37.48 7.67	9 09 54.66 228.86	1 06.03	16 20 19.9 1019.6	15 47.97
	9 12 05 29.81 8.27	9 13 43.52 228.26	1 05.95	16 03 20.3 1035.0	15 48.13
	10 12 05 21.54 -8.87	9 17 31.78 227.66	1 05.86	+15 46 05.3 - 1050.0	15 48.29
	11 12 05 12.67 9.45	9 21 19.44 227.08	1 05.78	15 28 35.3 1064.8	15 48.45
	12 12 05 03.22 10.02	9 25 06.52 226.51	1 05.70	15 10 50.5 1079.3	15 48.61
	13 12 04 53.20 10.58	9 28 53.03 225.95	1 05.62	14 52 51.2 1093.5	15 48.78
	14 12 04 42.62 11.13	9 32 38.98 225.39	1 05.54	14 34 37.7 1107.5	15 48.94
	15 12 04 31.49 -11.66	9 36 24.37 224.86	1 05.46	+14 16 10.2 - 1121.1	15 49.11
	16 12 04 19.83	9 40 09.23	1 05.38	+13 57 29.1	15 49.29

SUN, 1935

27

AT TRANSIT AT GREENWICH

Date	G.M.T.	Apparent Right Ascension	S.D. in Sidereal Time	Apparent Declination	Semi- diameter in Arc
Aug. 16	^{h m s} 12 04 19.83	^{h m s} 9 40 09.23	^{m s} I 05.38	^{° ' "} +13 57 29.1	^{' "} 15 49.29
17	12 04 07.66	9 43 53.58	I 05.30	13 38 34.7	15 49.46
18	12 03 54.98	9 47 37.42	I 05.23	13 19 27.1	15 49.64
19	12 03 41.81	9 51 20.77	I 05.16	13 00 06.8	15 49.82
20	12 03 28.16	9 55 03.64	I 05.08	12 40 34.0	15 50.00
21	12 03 14.05	9 58 46.04	I 05.01	+12 20 49.0	15 50.19
22	12 02 59.49	10 02 28.00	I 04.94	12 00 52.1	15 50.38
23	12 02 44.48	10 06 09.51	I 04.88	11 40 43.7	15 50.57
24	12 02 29.05	10 09 50.58	I 04.81	11 20 24.2	15 50.76
25	12 02 13.19	10 13 31.24	I 04.75	10 59 53.8	15 50.96
26	12 01 56.93	10 17 11.49	I 04.69	+10 39 12.8	15 51.17
27	12 01 40.28	10 20 51.34	I 04.63	10 18 21.7	15 51.38
28	12 01 23.24	10 24 30.81	I 04.57	9 57 20.8	15 51.59
29	12 01 05.83	10 28 09.91	I 04.52	9 36 10.3	15 51.81
30	12 00 48.06	10 31 48.64	I 04.47	9 14 50.8	15 52.03
31	12 00 29.94	10 35 27.03	I 04.42	+ 8 53 22.4	15 52.25
Sept. 1	12 00 11.50	10 39 05.09	I 04.37	8 31 45.6	15 52.48
2	11 59 52.73	10 42 42.83	I 04.33	8 10 00.6	15 52.71
3	11 59 33.66	10 46 20.26	I 04.29	7 48 07.8	15 52.95
4	11 59 14.31	10 49 57.41	I 04.25	7 26 07.6	15 53.19
5	11 58 54.68	10 53 34.28	I 04.21	+ 7 04 00.3	15 53.43
6	11 58 34.80	10 57 10.89	I 04.17	6 41 46.2	15 53.67
7	11 58 14.67	11 00 47.27	I 04.14	6 19 25.6	15 53.92
8	11 57 54.33	11 04 23.42	I 04.12	5 56 58.9	15 54.16
9	11 57 33.78	11 07 59.37	I 04.09	5 34 26.3	15 54.41
10	11 57 13.06	11 11 35.15	I 04.07	+ 5 11 48.3	15 54.67
11	11 56 52.18	11 15 10.76	I 04.05	4 49 05.0	15 54.92
12	11 56 31.16	11 18 46.24	I 04.03	4 26 16.8	15 55.17
13	11 56 10.03	11 22 21.61	I 04.01	4 03 23.9	15 55.42
14	11 55 48.82	11 25 56.89	I 04.00	3 40 26.7	15 55.67
15	11 55 27.54	11 29 32.10	I 03.99	+ 3 17 25.4	15 55.93
16	11 55 06.22	11 33 07.28	I 03.99	2 54 20.4	15 56.18
17	11 54 44.89	11 36 42.45	I 03.98	2 31 12.0	15 56.44
18	11 54 23.56	11 40 17.61	I 03.98	2 08 00.5	15 56.69
19	11 54 02.26	11 43 52.80	I 03.99	1 44 46.1	15 56.95
20	11 53 41.01	11 47 28.05	I 03.99	+ 1 21 29.3	15 57.21
21	11 53 19.83	11 51 03.36	I 04.00	0 58 10.5	15 57.47
22	11 52 58.73	11 54 38.76	I 04.01	0 34 49.9	15 57.73
23	11 52 37.73	11 58 14.26	I 04.03	+ 0 11 27.9	15 57.99
24	11 52 16.86	12 01 49.88	I 04.04	- 0 11 55.1	15 58.26
25	11 51 56.13	12 05 25.65	I 04.06	- 0 35 18.7	15 58.53
26	11 51 35.56	12 09 01.57	I 04.09	0 58 42.7	15 58.80
27	11 51 15.17	12 12 37.68	I 04.12	1 22 06.5	15 59.07
28	11 50 54.97	12 16 13.98	I 04.15	1 45 30.0	15 59.34
29	11 50 34.98	12 19 50.49	I 04.18	2 08 52.6	15 59.62
30	11 50 15.22	12 23 27.23	I 04.22	- 2 32 14.1	15 59.90
Oct. 1	11 49 55.71	12 27 04.22	I 04.26	- 2 55 34.1	16 00.18

AT TRANSIT AT GREENWICH

Date	G.M.T.	Apparent Right Ascension	S.D. in Sidereal Time	Apparent Declination	Semi- diameter in Arc
Oct. 1	^{h m s} 11 49 55.71 -19.24	^{h m s} 12 27 04.22 217.26	^{m s} 1 04.26	- 2 55 34.1 -1398.0	16 00.18
2	11 49 36.47 18.96	12 30 41.48 217.54	1 04.30	3 18 52.1 1395.8	16 00.46
3	11 49 17.51 18.66	12 34 19.02 217.84	1 04.35	3 42 07.9 1393.1	16 00.74
4	11 48 58.85 18.34	12 37 56.86 218.16	1 04.40	4 05 21.0 1390.1	16 01.02
5	11 48 40.51 18.00	12 41 35.02 218.50	1 04.45	4 28 31.1 1386.8	16 01.31
6	11 48 22.51 -17.65	12 45 13.52 218.86	1 04.50	- 4 51 37.9 -1383.0	16 01.59
7	11 48 04.86 17.27	12 48 52.38 219.24	1 04.56	5 14 40.9 1379.0	16 01.88
8	11 47 47.59 16.87	12 52 31.62 219.63	1 04.62	5 37 39.9 1374.6	16 02.16
9	11 47 30.72 16.45	12 56 11.25 220.06	1 04.68	6 00 34.5 1369.8	16 02.44
10	11 47 14.27 16.00	12 59 51.31 220.51	1 04.75	6 23 24.3 1364.7	16 02.72
11	11 46 58.27 -15.54	13 03 31.82 220.98	1 04.82	- 6 46 09.0 -1359.4	16 03.00
12	11 46 42.73 15.04	13 07 12.80 221.47	1 04.89	7 08 48.4 1353.6	16 03.28
13	11 46 27.69 14.53	13 10 54.27 221.98	1 04.96	7 31 22.0 1347.4	16 03.55
14	11 46 13.16 13.99	13 14 36.25 222.53	1 05.04	7 53 49.4 1341.0	16 03.83
15	11 45 59.17 13.42	13 18 18.78 223.09	1 05.12	8 16 10.4 1334.1	16 04.10
16	11 45 45.75 -12.85	13 22 01.87 223.67	1 05.20	- 8 38 24.5 -1327.0	16 04.37
17	11 45 32.90 12.25	13 25 45.54 224.27	1 05.28	9 00 31.5 1319.3	16 04.64
18	11 45 20.65 11.63	13 29 29.81 224.90	1 05.37	9 22 30.8 1311.4	16 04.91
19	11 45 09.02 10.99	13 33 14.71 225.53	1 05.46	9 44 22.2 1303.0	16 05.17
20	11 44 58.03 10.34	13 37 00.24 226.18	1 05.55	10 06 05.2 1294.2	16 05.44
21	11 44 47.69 - 9.68	13 40 46.42 226.85	1 05.64	-10 27 39.4 -1285.0	16 05.70
22	11 44 38.01 9.00	13 44 33.27 227.53	1 05.73	10 49 04.4 1275.4	16 05.97
23	11 44 29.01 8.31	13 48 20.80 228.22	1 05.83	11 10 19.8 1265.4	16 06.23
24	11 44 20.70 7.60	13 52 09.02 228.93	1 05.93	11 31 25.2 1255.0	16 06.50
25	11 44 13.10 6.89	13 55 57.95 229.65	1 06.03	11 52 20.2 1244.1	16 06.76
26	11 44 06.21 - 6.16	13 59 47.60 230.38	1 06.14	-12 13 04.3 -1232.8	16 07.02
27	11 44 00.05 5.42	14 03 37.98 231.12	1 06.24	12 33 37.1 1221.2	16 07.28
28	11 43 54.63 4.67	14 07 29.10 231.87	1 06.35	12 53 58.3 1209.1	16 07.55
29	11 43 49.96 3.92	14 11 20.97 232.62	1 06.46	13 14 07.4 1196.6	16 07.81
30	11 43 46.04 3.16	14 15 13.59 233.39	1 06.57	13 34 04.0 1183.6	16 08.07
31	11 43 42.88 - 2.39	14 19 06.98 234.15	1 06.68	-13 53 47.6 -1170.4	16 08.33
Nov. 1	11 43 40.49 1.61	14 23 01.13 234.94	1 06.80	14 13 18.0 1156.5	16 08.59
2	11 43 38.88 0.83	14 26 56.07 235.73	1 06.91	14 32 34.5 1142.3	16 08.84
3	11 43 38.05 - 0.04	14 30 51.80 236.51	1 07.03	14 51 36.8 1127.8	16 09.10
4	11 43 38.01 + 0.75	14 34 48.31 237.32	1 07.14	15 10 24.6 1112.9	16 09.35
5	11 43 38.76 + 1.56	14 38 45.63 238.12	1 07.26	-15 28 57.5 -1097.4	16 09.60
6	11 43 40.32 2.38	14 42 43.75 238.94	1 07.38	15 47 14.9 1081.8	16 09.85
7	11 43 42.70 3.20	14 46 42.69 239.76	1 07.50	16 05 16.7 1065.5	16 10.10
8	11 43 45.90 4.02	14 50 42.45 240.59	1 07.62	16 23 02.2 1049.1	16 10.34
9	11 43 49.92 4.87	14 54 43.04 241.44	1 07.74	16 40 31.3 1032.2	16 10.58
10	11 43 54.79 + 5.71	14 58 44.48 242.28	1 07.85	-16 57 43.5 -1014.9	16 10.81
11	11 44 00.50 6.56	15 02 46.76 243.13	1 07.97	17 14 38.4 997.1	16 11.04
12	11 44 07.06 7.42	15 06 49.89 244.00	1 08.09	17 31 15.5 979.2	16 11.26
13	11 44 14.48 8.28	15 10 53.89 244.86	1 08.21	17 47 34.7 960.7	16 11.49
14	11 44 22.76 9.15	15 14 58.75 245.73	1 08.33	18 03 35.4 941.8	16 11.70
15	11 44 31.91 +10.01	15 19 04.48 246.59	1 08.45	-18 19 17.2 - 922.6	16 11.91
16	11 44 41.92	15 23 11.07	1 08.57	-18 34 39.8	16 12.12

AT TRANSIT AT GREENWICH

Date	G.M.T.	Apparent Right Ascension	S.D. in Sidereal Time	Apparent Declination	Semi- diameter in Arc
Nov. 16	^h ^m ^s 11 44 41.92	^h ^m ^s 15 23 11.07	^m ^s 1 08.57	[°] ['] ["] -18 34 39.8	['] ["] 16 12.12
17	11 44 52.79	15 27 18.53	1 08.68	18 49 42.8	16 12.33
18	11 45 04.52	15 31 26.85	1 08.80	19 04 25.8	16 12.53
19	11 45 17.10	15 35 36.02	1 08.91	19 18 48.3	16 12.73
20	11 45 30.53	15 39 46.04	1 09.03	19 32 50.0	16 12.92
21	11 45 44.79	15 43 56.90	1 09.14	-19 46 30.5	16 13.12
22	11 45 59.88	15 48 08.59	1 09.25	19 59 49.5	16 13.31
23	11 46 15.78	15 52 21.09	1 09.36	20 12 46.5	16 13.49
24	11 46 32.48	15 56 34.39	1 09.47	20 25 21.1	16 13.68
25	11 46 49.97	16 00 48.48	1 09.57	20 37 33.2	16 13.86
26	11 47 08.22	16 05 03.34	1 09.68	-20 49 22.1	16 14.04
27	11 47 27.22	16 09 18.95	1 09.78	21 00 47.7	16 14.22
28	11 47 46.95	16 13 35.29	1 09.88	21 11 49.6	16 14.39
29	11 48 07.38	16 17 52.34	1 09.98	21 22 27.5	16 14.56
30	11 48 28.50	16 22 10.07	1 10.07	21 32 41.1	16 14.73
Dec. 1	11 48 50.28	16 26 28.47	1 10.16	-21 42 29.9	16 14.90
2	11 49 12.70	16 30 47.51	1 10.25	21 51 53.9	16 15.06
3	11 49 35.74	16 35 07.17	1 10.34	22 00 52.7	16 15.21
4	11 49 59.37	16 39 27.42	1 10.42	22 09 26.0	16 15.37
5	11 50 23.57	16 43 48.24	1 10.50	22 17 33.5	16 15.52
6	11 50 48.31	16 48 09.61	1 10.58	-22 25 15.1	16 15.66
7	11 51 13.58	16 52 31.52	1 10.65	22 32 30.5	16 15.80
8	11 51 39.36	16 56 53.92	1 10.72	22 39 19.5	16 15.93
9	11 52 05.61	17 01 16.80	1 10.78	22 45 41.9	16 16.06
10	11 52 32.32	17 05 40.14	1 10.84	22 51 37.4	16 16.18
11	11 52 59.47	17 10 03.92	1 10.90	-22 57 05.9	16 16.29
12	11 53 27.03	17 14 28.11	1 10.95	23 02 07.2	16 16.40
13	11 53 54.96	17 18 52.68	1 11.00	23 06 41.1	16 16.50
14	11 54 23.25	17 23 17.61	1 11.04	23 10 47.5	16 16.60
15	11 54 51.87	17 27 42.87	1 11.08	23 14 26.2	16 16.69
16	11 55 20.79	17 32 08.42	1 11.11	-23 17 37.0	16 16.78
17	11 55 49.96	17 36 34.23	1 11.14	23 20 19.9	16 16.86
18	11 56 19.37	17 41 00.28	1 11.17	23 22 34.8	16 16.93
19	11 56 48.98	17 45 26.52	1 11.19	23 24 21.5	16 17.00
20	11 57 18.75	17 49 52.93	1 11.21	23 25 40.0	16 17.07
21	11 57 48.64	17 54 19.47	1 11.22	-23 26 30.2	16 17.13
22	11 58 18.63	17 58 46.10	1 11.23	23 26 52.1	16 17.19
23	11 58 48.67	18 03 12.78	1 11.23	23 26 45.7	16 17.25
24	11 59 18.73	18 07 39.48	1 11.23	23 26 10.9	16 17.30
25	11 59 48.76	18 12 06.15	1 11.22	23 25 07.9	16 17.34
26	12 00 18.74	18 16 32.77	1 11.21	-23 23 36.5	16 17.38
27	12 00 48.62	18 20 59.29	1 11.20	23 21 36.9	16 17.42
28	12 01 18.35	18 25 25.67	1 11.18	23 19 09.0	16 17.46
29	12 01 47.91	18 29 51.87	1 11.16	23 16 13.1	16 17.50
30	12 02 17.26	18 34 17.85	1 11.13	23 12 49.2	16 17.52
31	12 02 46.35	18 38 43.58	1 11.09	-23 08 57.4	16 17.54
32	12 03 15.16	18 43 09.02	1 11.06	23 04 37.7	16 17.56

SUN'S CO-ORDINATES, 1935

		MEAN EQUATOR AND EQUINOX OF 1935.0											
Date		X				Y				Z			
Jan.	1	+0.1647679	+172221	- 501	-0.8893502	+ 28334	+2778	-0.3857395	+ 12292	+1206			
	2	.1819900	171663	558	.8865168	31106	2772	.3845103	13495	1203			
	3	.1991563	171049	614	.8834062	33870	2764	.3831608	14697	1202			
	4	.2162612	170378	671	.8800192	36625	2755	.3816911	15892	1195			
	5	.2332990	169648	730	.8763567	39370	2745	.3801019	17082	1190			
	6	+0.2502638	+168861	- 787	-0.8724197	+ 42101	+2731	-0.3783937	+ 18267	+1185			
	7	.2671499	168018	843	.8682096	44815	2714	.3765670	19444	1177			
	8	.2839517	167119	899	.8637281	47512	2697	.3746226	20614	1170			
	9	.3006636	166166	953	.8589769	50191	2679	.3725612	21775	1161			
	10	.3172802	165162	1004	.8539578	52851	2660	.3703837	22927	1152			
	11	+0.3337964	+164107	-1055	-0.8486727	+ 55489	+2638	-0.3680910	+ 24070	+1143			
	12	.3502071	163001	1106	.8431238	58107	2618	.3656840	25203	1133			
	13	.3665072	161848	1153	.8373131	60702	2595	.3631637	26327	1124			
	14	.3826920	160647	1201	.8312429	63276	2574	.3605310	27442	1115			
	15	.3987567	159399	1248	.8249153	65830	2554	.3577868	28548	1106			
	16	+0.4146966	+158105	-1294	-0.8183323	+ 68360	+2530	-0.3549320	+ 29645	+1097			
	17	.4305071	156767	1338	.8114963	70869	2509	.3519675	30731	1086			
	18	.4461838	155382	1385	.8044094	73355	2486	.3488944	31810	1079			
	19	.4617220	153953	1429	.7970739	75818	2463	.3457134	32878	1068			
	20	.4771173	152479	1474	.7894921	78260	2442	.3424256	33937	1059			
	21	+0.4923652	+150961	-1518	-0.7816661	+ 80676	+2416	-0.3390319	+ 34986	+1049			
	22	.5074613	149397	1564	.7735985	83071	2395	.3355333	36024	1038			
	23	.5224010	147790	1607	.7652914	85441	2370	.3319309	37054	1030			
	24	.5371800	146139	1651	.7567473	87785	2344	.3282255	38071	1017			
	25	.5517939	144442	1697	.7479688	90105	2320	.3244184	39078	1007			
	26	+0.5662381	+142700	-1742	-0.7389583	+ 92399	+2294	-0.3205106	+ 40075	+ 997			
	27	.5805081	140916	1784	.7297184	94666	2267	.3165031	41060	985			
	28	.5945997	139087	1829	.7202518	96907	2241	.3123971	42033	973			
	29	.6085084	137213	1874	.7105611	99119	2212	.3081938	42993	960			
	30	.6222297	135294	1919	.7006492	101300	2181	.3038945	43942	949			
Feb.	31	+0.6357591	+133330	-1964	-0.6905192	+103453	+2153	-0.2995003	+ 44877	+ 935			
	1	.6490921	131322	2008	.6801739	105573	2120	.2950126	45798	921			
	2	.6622243	129268	2054	.6696166	107658	2085	.2904328	46702	904			
	3	.6751511	127170	2098	.6588508	109709	2051	.2857626	47591	889			
	4	.6878681	125032	2138	.6478799	111722	2013	.2810035	48463	872			
	5	+0.7003713	+122854	-2178	-0.6367077	+113695	+1973	-0.2761572	+ 49318	+ 855			
	6	.7126567	120637	2217	.6253382	115628	1933	.2712254	50156	838			
	7	.7247204	118384	2253	.6137754	117520	1892	.2662098	50975	819			
	8	.7365588	116097	2287	.6020234	119371	1851	.2611123	51777	802			
	9	.7481685	113777	2320	.5900863	121182	1811	.2559346	52560	783			
	10	+0.7595462	+111427	-2350	-0.5779681	+122951	+1769	-0.2506786	+ 53325	+ 765			
	11	.7706889	109046	2381	.5656730	124681	1730	.2453461	54074	749			
	12	.7815935	106637	2409	.5532049	126370	1689	.2399387	54804	730			
	13	.7922572	104200	2437	.5405679	128017	1647	.2344583	55519	715			
	14	.8026772	101735	2465	.5277662	129625	1608	.2289064	56217	698			
	15	+0.8128507	+ 99244	-2491	-0.5148037	+131192	+1567	-0.2232847	+ 56896	+ 679			
	16	+0.8227751	-2519	-2519	-0.5016845	+131192	+1529	-0.2175951	+ 56896	+ 661			

SUN'S CO-ORDINATES, 1935

31

Date		MEAN EQUATOR AND EQUINOX OF 1935-0								
		X			Y			Z		
Feb.	16	+0.8227751		-2519	-0.5016845	+132721	+1529	-0.2175951		+ 661
	17	+ 96725	2543		+132721	1489		+ 57557		+ 646
	18	.8418658	94182	2568	.4884124	134210	1447	.2118394	58203	630
	19	.8510272	91614	2594	.4749914	135657	1407	.2060191	58833	611
	20	.8599292	89020	2618	.4614257	137064	1367	.2001358	59444	593
			86402		.4477193	138431		.1941914	60037	
	21	+0.8685694		-2642	-0.4338762	+139757	+1326	-0.1881877		+ 577
	22	+ 83760	2666		.4199005	141043	1286	.1821263	60614	559
	23	.8769454	81094	2690	.4057962	142288	1245	.1760090	61173	541
	24	.8850548	78404	2713	.4057962	143492	1204	.1698376	61714	523
	25	.8928952	75691	2736	.3915674	144652	1160	.1636139	62237	507
		.9004643	72955		.3772182				62744	
	26	+0.9077598		-2758	-0.3627530	+145771	+1119	-0.1573395		+ 487
	27	+ 70197	2782		.3481759	146846	1075	.1510164	63231	466
	28	.9147795	67415	2806	.3334913	147877	1031	.1446467	63697	448
Mar.	1	.9215210	64609	2827	.3187036	148863	986	.1382322	64145	428
	2	.9279819	61782	2846	.3038173	149801	938	.1317749	64573	407
		.9341601	58936						64980	
	3	+0.9400537		-2867	-0.2888372	+150691	+ 890	-0.1252769		+ 385
	4	+ 56069	2887		.2737681	151532	841	.1187404	65365	365
	5	.9456606	53182	2902	.2586149	152322	790	.1121674	65730	341
	6	.9509788	50280	2914	.2433827	153060	738	.1055603	66071	319
	7	.9560068	47366	2926	.2280767	153747	687	.0989213	66390	297
		.9607434	44440						66687	
	8	+0.9651874		-2937	-0.2127020	+154386	+ 639	-0.0922526		+ 274
	9	+ 41503	2945		.1972634	154972	586	.0855565	66961	253
	10	.9693377	38558	2948	.1817662	155508	536	.0788351	67214	232
	11	.9731935	35610	2954	.1662154	155997	489	.0720905	67446	211
	12	.9767545	32656	2958	.1506157	156437	440	.0653248	67657	188
		.9800201	29698						67845	
	13	+0.9829899		-2962	-0.1349720	+156831	+ 394	-0.0585403		+ 170
	14	+ 26736	2965		.1192889	157177	346	.0517388	68015	151
	15	.9856635	23771	2966	.1035712	157476	299	.0449222	68166	129
	16	.9880406	20805	2966	.0878236	157729	253	.0380927	68295	110
	17	.9901211	17839	2969	.0720507	157937	208	.0312522	68405	91
		.9919050	14870						68496	
	18	+0.9933920		-2968	-0.0562570	+158100	+ 163	-0.0244026		+ 71
	19	+ 11902	2969		.0404470	158217	117	.0175459	68567	53
	20	.9945822	8933	2967	.0246253	158289	72	.0106839	68620	32
	21	.9954755	5966	2968	.0087964	158316	27	.0038187	68652	13
	22	.9960721	2998	2965	.0070352	158299	17	.0030478	68665	6
		.9963719	33						68659	
	23	+0.9963752		-2966	+0.0228651	+158240	- 59	+0.0099137		- 26
	24	+ 2933	2962		.0386891	158134	106	.0167770	68633	44
	25	.9960819	5895	2963	.0545025	157983	151	.0236359	68589	63
	26	.9954924	8858	2959	.0703008	157787	196	.0304885	68526	83
	27	.9946066	11817	2957	.0860795	157545	242	.0373328	68443	104
		.9934249	14774						68339	
	28	+0.9919475		-2954	+0.1018340	+157259	- 286	+0.0441667		- 124
	29	+ 17728	2950		.1175599	156926	333	.0509882	68215	146
	30	.9901747	20678	2946	.1332525	156543	383	.0577951	68069	166
	31	.9881069	23624	2940	.1489068	156110	433	.0645854	67903	187
Apr.	1	.9857445	26564	2932	.1645178	155629	481	.0713570	67716	210
		.9830881	29496						67506	
	2	+0.9801385		-2921	+0.1800807	+155100	- 529	+0.0781076		- 231
	3	+ 32417	2910		.1955907		- 580	+0.0848351	67215	- 253

SUN'S CO-ORDINATES, 1935

		MEAN EQUATOR AND EQUINOX OF 1935.0								
Date		X			Y			Z		
Apr.	1	+0.9830881	-29496	-2932	+0.1645178	+155629	-481	+0.0713570	+67506	-210
	2	.9801385	32417	2921	.1800807	155100	529	.0781076	67275	231
	3	.9768968	35327	2910	.1955907	154520	580	.0848351	67022	253
	4	.9733641	38223	2896	.2110427	153891	629	.0915373	66746	276
	5	.9695418	41103	2880	.2264318	153213	678	.0982119	66451	295
	6	+0.9654315	-43965	-2862	+0.2417531	+152488	-725	+0.1048570	+66137	-314
	7	.9610350	46808	2843	.2570019	151717	771	.1114707	65800	337
	8	.9563542	49630	2822	.2721736	150900	817	.1180507	65444	356
	9	.9513912	52432	2802	.2872636	150041	859	.1245951	65070	374
	10	.9461480	55213	2781	.3022677	149138	903	.1311021	64680	390
	11	+0.9406267	-57973	-2760	+0.3171815	+148193	-945	+0.1375701	+64269	-411
	12	.9348294	60710	2737	.3320008	147206	987	.1439970	63840	429
	13	.9287584	63426	2716	.3467214	146178	1028	.1503810	63396	444
	14	.9224158	66119	2693	.3613392	145112	1066	.1567206	62934	462
	15	.9158039	68790	2671	.3758504	144006	1106	.1630140	62455	479
	16	+0.9089249	-71435	-2645	+0.3902510	+142861	-1145	+0.1692595	+61959	-496
	17	.9017814	74058	2623	.4045371	141678	1183	.1754554	61448	511
	18	.8943756	76657	2599	.4187049	140457	1221	.1816002	60920	528
	19	.8867099	79233	2576	.4327506	139199	1258	.1876922	60377	543
	20	.8787866	81785	2552	.4466705	137906	1293	.1937299	59816	561
	21	+0.8706081	-84315	-2530	+0.4604611	+136576	-1330	+0.1997115	+59240	-576
	22	.8621766	86821	2506	.4741187	135208	1368	.2056355	58650	590
	23	.8534945	89303	2482	.4876395	133803	1405	.2115005	58042	608
	24	.8445642	91760	2457	.5010198	132360	1443	.2173047	57416	626
	25	.8353882	94194	2434	.5142558	130882	1478	.2230463	56774	642
	26	+0.8259688	-96602	-2408	+0.5273440	+129365	-1517	+0.2287237	+56116	-658
	27	.8163086	98984	2382	.5402805	127808	1557	.2343353	55439	677
	28	.8064102	101337	2353	.5530613	126213	1595	.2398792	54747	692
	29	.7962765	103661	2324	.5656826	124579	1634	.2453539	54037	710
	30	.7859104	105954	2293	.5781405	122906	1673	.2507576	53310	727
May	1	+0.7753150	-108214	-2260	+0.5904311	+121195	-1711	+0.2560886	+52566	-744
	2	.7644936	110439	2225	.6025506	119446	1749	.2613452	51806	760
	3	.7534497	112629	2190	.6144952	117661	1785	.2665258	51031	775
	4	.7421868	114779	2150	.6262613	115841	1820	.2716289	50240	791
	5	.7307089	116892	2113	.6378454	113988	1853	.2766529	49434	806
	6	+0.7190197	-118966	-2074	+0.6492442	+112103	-1885	+0.2815963	+48615	-819
	7	.7071231	121002	2036	.6604545	110186	1917	.2864578	47784	831
	8	.6950229	122996	1994	.6714731	108240	1946	.2912362	46940	844
	9	.6827233	124950	1954	.6822971	106267	1973	.2959302	46084	856
	10	.6702283	126866	1916	.6929238	104265	2002	.3005386	45217	867
	11	+0.6575417	-128743	-1877	+0.7033503	+102237	-2028	+0.3050603	+44338	-879
	12	.6446674	130580	1837	.7135740	100184	2053	.3094941	43448	890
	13	.6316094	132377	1797	.7235924	98106	2078	.3138389	42548	900
	14	.6183717	134134	1757	.7334030	96002	2104	.3180937	41637	911
	15	.6049583	135853	1719	.7430032	93876	2126	.3222574	40717	920
	16	+0.5913730	-137531	-1678	+0.7523908	+91728	-2148	+0.3263291	+39786	-931
	17	+0.5776199	-137531	-1640	+0.7615636	+91728	-2171	+0.3303077	+39786	-939

Date		MEAN EQUATOR AND EQUINOX OF 1935.0								
		X			Y			Z		
May	17	+0.5776199	-139171	-1640	+0.7615636	+ 89557	-2171	+0.3303077	+ 38847	- 939
	18	.5637028	140773	1602	.7705193	87365	2192	.3341924	37898	949
	19	.5496255	142335	1562	.7792558	85153	2212	.3379822	36938	960
	20	.5353920	143861	1526	.7877711	82919	2234	.3416760	35970	968
	21	.5210059	145348	1487	.7960630	80661	2258	.3452730	34993	977
	22	+0.5064711	-146798	-1450	+0.8041291	+ 78384	-2277	+0.3487723	+ 34004	- 989
	23	.4917913	148209	1411	.8119675	76083	2301	.3521727	33006	998
	24	.4769704	149579	1370	.8195758	73758	2325	.3554733	31998	1008
	25	.4620125	150910	1331	.8269516	71412	2346	.3586731	30979	1019
	26	.4469215	152199	1289	.8340928	69045	2367	.3617710	29951	1028
	27	+0.4317016	-153444	-1245	+0.8409973	+ 66654	-2391	+0.3647661	+ 28913	-1038
	28	.4163572	154645	1201	.8476627	64243	2411	.3676574	27865	1048
	29	.4008927	155800	1155	.8540870	61811	2432	.3704439	26808	1057
	30	.3853127	156908	1108	.8602681	59359	2452	.3731247	25743	1065
	31	.3696219	157968	1060	.8662040	56888	2471	.3756990	24670	1073
June	1	+0.3538251	-158978	-1010	+0.8718928	+ 54400	-2488	+0.3781660	+ 23589	-1081
	2	.3379273	159940	962	.8773328	51898	2502	.3805249	22504	1085
	3	.3219333	160853	913	.8825226	49381	2517	.3827753	21413	1091
	4	.3058480	161716	863	.8874607	46852	2529	.3849166	20315	1098
	5	.2896764	162528	812	.8921459	44313	2539	.3869481	19213	1102
	6	+0.2734236	-163293	-765	+0.8965772	+ 41764	-2549	+0.3888694	+ 18107	-1106
	7	.2570943	164008	715	.9007536	39205	2559	.3906801	16998	1109
	8	.2406935	164677	669	.9046741	36639	2566	.3923799	15887	1111
	9	.2242258	165297	620	.9083380	34066	2573	.3939686	14773	1114
	10	.2076961	165870	573	.9117446	31486	2580	.3954459	13655	1118
	11	+0.1911091	-166394	-524	+0.9148932	+ 28903	-2583	+0.3968114	+ 12534	-1121
	12	.1744697	166873	479	.9177835	26314	2589	.3980648	11414	1120
	13	.1577824	167306	433	.9204149	23720	2594	.3992062	10292	1122
	14	.1410518	167692	386	.9227869	21124	2596	.4002354	9166	1126
	15	.1242826	168035	343	.9248993	18527	2597	.4011520	8040	1126
	16	+0.1074791	-168334	-299	+0.9267520	+ 15926	-2601	+0.4019560	+ 6913	-1127
	17	.0906457	168587	253	.9283446	13321	2605	.4026473	5785	1128
	18	.0737870	168799	212	.9296767	10714	2607	.4032258	4655	1130
	19	.0569071	168968	169	.9307481	8105	2609	.4036913	3522	1133
	20	.0400103	169092	124	.9315586	5490	2615	.4040435	2388	1134
	21	+0.0231011	-169171	-79	+0.9321076	+ 2871	-2619	+0.4042823	+ 1252	-1136
	22	.0061840	169206	35	.9323947	2621	2621	.4044075	114	1138
	23	-.0107366	169193	13	.9324197	2374	2624	.4044189	1026	1140
	24	.0276559	169132	61	.9321823	5002	2628	.4043163	2169	1143
	25	.0445691	169022	110	.9316821	7632	2630	.4040994	3311	1142
	26	-0.0614713	-168864	+ 158	+0.9309189	+ 10263	-2631	+0.4037683	+ 4453	-1142
	27	.0783577	168654	210	.9298926	12892	2629	.4033230	5595	1142
	28	.0952231	168393	261	.9286034	15519	2627	.4027635	6736	1141
	29	.1120624	168083	310	.9270515	18144	2625	.4020899	7876	1140
	30	.1288707	167721	362	.9252371	20763	2619	.4013023	9012	1136
July	1	-0.1456428	-167307	+ 414	+0.9231608	+ 23375	-2612	+0.4004011	+ 10146	-1134
	2	-0.1623735	+ 462	+ 462	+0.9208233	- 23375	-2607	+0.3993865	- 10146	-1130

SUN'S CO-ORDINATES, 1935

Date		MEAN EQUATOR AND EQUINOX OF 1935-0											
		X				Y				Z			
July	1	-0.1456428	-167307	+ 414	+0.9231608	- 23375	-2612	+0.4004011	- 10146	-1134			
	2	.1623735	166845	462	.9208233	25982	2607	.3993865	11276	1130			
	3	.1790580	166332	513	.9182251	28579	2597	.3982589	12402	1126			
	4	.1956912	165769	563	.9153672	31164	2585	.3970187	13523	1121			
	5	.2122681	165159	610	.9122508	33739	2575	.3956664	14639	1116			
	6	-0.2287840	-164502	+ 657	+0.9088769	- 36304	-2565	+0.3942025	- 15750	-1111			
	7	.2452342	163797	705	.9052465	38855	2551	.3926275	16855	1105			
	8	.2616139	163046	751	.9013610	41392	2537	.3909420	17953	1098			
	9	.2779185	162248	798	.8972218	43914	2522	.3891467	19046	1093			
	10	.2941433	161406	842	.8928304	46421	2507	.3872421	20133	1087			
	11	-0.3102839	-160520	+ 886	+0.8881883	- 48914	-2493	+0.3852288	- 21211	-1078			
	12	.3263359	159591	929	.8832969	51391	2477	.3831077	22283	1072			
	13	.3422950	158621	970	.8781578	53851	2460	.3808794	23351	1068			
	14	.3581571	157608	1013	.8727727	56294	2443	.3785443	24410	1059			
	15	.3739179	156556	1052	.8671433	58720	2426	.3761033	25461	1051			
	16	-0.3895735	-155466	+1090	+0.8612713	- 61132	-2412	+0.3735572	- 26506	-1045			
	17	.4051201	154335	1131	.8551581	63528	2396	.3709066	27547	1041			
	18	.4205536	153163	1172	.8488053	65910	2382	.3681519	28581	1034			
	19	.4358699	151950	1213	.8422143	68276	2366	.3652938	29609	1028			
	20	.4510649	150696	1254	.8353867	70629	2353	.3623329	30630	1021			
	21	-0.4661345	-149399	+1297	+0.8283238	- 72965	-2336	+0.3592699	- 31645	-1015			
	22	.4810744	148058	1341	.8210273	75285	2320	.3561054	32653	1008			
	23	.4958802	146674	1384	.8134988	77589	2304	.3528401	33654	1001			
	24	.5105476	145245	1429	.8057399	79874	2285	.3494747	34647	993			
	25	.5250721	143771	1474	.7977525	82138	2264	.3460100	35629	982			
	26	-0.5394492	-142253	+1518	+0.7895387	- 84381	-2243	+0.3424471	- 36604	- 975			
	27	.5536745	140690	1563	.7811006	86602	2221	.3387867	37569	965			
	28	.5677435	139084	1606	.7724404	88799	2197	.3350298	38522	953			
	29	.5816519	137435	1649	.7635605	90971	2172	.3311776	39463	941			
	30	.5953954	135744	1691	.7544634	93115	2144	.3272313	40393	930			
	31	-0.6089698	-134011	+1733	+0.7451519	- 95232	-2117	+0.3231920	- 41312	- 919			
Aug.	1	.6223709	132238	1773	.7356287	97322	2090	.3190608	42217	905			
	2	.6355947	130424	1814	.7258965	99384	2062	.3148391	43109	892			
	3	.6486371	128573	1851	.7159581	101413	2029	.3105282	43988	879			
	4	.6614944	126685	1888	.7058168	103412	1999	.3061294	44854	866			
	5	-0.6741629	-124759	+1926	+0.6954756	- 105381	-1969	+0.3016440	- 45707	- 853			
	6	.6866388	122799	1960	.6849375	107318	1937	.2970733	46545	838			
	7	.6989187	120804	1995	.6742057	109224	1906	.2924188	47370	825			
	8	.7109991	118775	2029	.6632833	111095	1871	.2876818	48181	811			
	9	.7228766	116716	2059	.6521738	112933	1838	.2828637	48977	796			
	10	-0.7345482	-114625	+2091	+0.6408805	- 114739	-1806	+0.2779660	- 49759	- 782			
	11	.7460107	112504	2121	.6294066	116513	1774	.2729901	50528	769			
	12	.7572611	110354	2150	.6177553	118254	1741	.2679373	51282	754			
	13	.7682965	108177	2177	.6059299	119963	1709	.2628091	52024	742			
	14	.7791142	105973	2204	.5939336	121641	1678	.2576067	52753	729			
	15	-0.7897115	-103739	+2234	+0.5817695	- 123289	-1648	+0.2523314	- 53468	- 715			
	16	-0.8000854	-101379	+2264	+0.5694406	- 12518	-1618	+0.2469846	- 54268	- 702			

Date		MEAN EQUATOR AND EQUINOX OF 1935.0								
		X			Y			Z		
Aug.	16	-0.8000854	-101475	+2264	+0.5694406	-124907	-1618	+0.2469846	-54170	-702
	17	.8102329	99184	2291	.5569499	126493	1586	.2415676	54861	691
	18	.8201513	96862	2322	.5443006	128049	1556	.2360815	55538	677
	19	.8298375	94509	2353	.5314957	129573	1524	.2305277	56201	663
	20	.8392884	92124	2385	.5185384	131064	1491	.2249076	56848	647
	21	-0.8485008	-89709	+2415	+0.5054320	-132520	-1456	+0.2192228	-57481	-633
	22	.8574717	87264	2445	.4921800	133941	1421	.2134747	58099	618
	23	.8661981	84789	2475	.4787859	135327	1386	.2076648	58700	601
	24	.8746770	82283	2506	.4652532	136673	1346	.2017948	59286	586
	25	.8829053	79748	2535	.4515859	137979	1306	.1958662	59852	566
	26	-0.8908801	-77186	+2562	+0.4377880	-139247	-1268	+0.1898810	-60401	-549
	27	.8985987	74600	2586	.4238633	140473	1226	.1838409	60933	532
	28	.9060587	71987	2613	.4098160	141656	1183	.1777476	61447	514
	29	.9132574	69351	2636	.3956504	142800	1144	.1716029	61941	494
	30	.9201925	66692	2659	.3813704	143901	1101	.1654088	62416	475
Sept.	31	-0.9268617	-64010	+2682	+0.3669803	-144956	-1055	+0.1591672	-62872	-456
	1	.9332627	61308	2702	.3524847	145969	1013	.1528800	63311	439
	2	.9393935	58590	2718	.3378878	146939	970	.1465489	63731	420
	3	.9452525	55853	2737	.3231939	147864	925	.1401758	64130	399
	4	.9508378	53098	2755	.3084075	148743	879	.1337628	64510	380
	5	-0.9561476	-50329	+2769	+0.2935332	-149578	-835	+0.1273118	-64871	-361
	6	.9611805	47548	2781	.2785754	150370	792	.1208247	65213	342
	7	.9659353	44754	2794	.2635384	151117	747	.1143034	65536	323
	8	.9704107	41947	2807	.2484267	151820	703	.1077498	65841	305
	9	.9746054	39131	2816	.2332447	152479	659	.1011657	66128	287
	10	-0.9785185	-36307	+2824	+0.2179968	-153097	-618	+0.0945529	-66397	-269
	11	.9821492	33472	2835	.2026871	153675	578	.0879132	66646	249
	12	.9854964	30629	2843	.1873196	154212	537	.0812486	66881	235
	13	.9885593	27776	2853	.1718984	154709	497	.0745605	67099	218
	14	.9913369	24911	2865	.1564275	155164	455	.0678506	67298	199
	15	-0.9938280	-22037	+2874	+0.1409111	-155579	-415	+0.0611208	-67479	-181
	16	.9960317	19151	2886	.1253532	155954	375	.0543729	67643	164
	17	.9979468	16255	2896	.1097578	156285	331	.0476086	67789	146
	18	.9995723	13346	2909	.0941293	156574	289	.0408297	67915	126
	19	1.0009069	10428	2918	.0784719	156818	244	.0340382	68022	107
	20	-1.0019497	-7501	+2927	+0.0627901	-157016	-198	+0.0272360	-68109	-87
	21	1.0026998	4566	2935	.0470885	157168	152	.0204251	68174	65
	22	1.0031564	1623	2943	.0313717	157273	105	.0136077	68219	45
	23	1.0033187	1325	2948	.0156444	157328	55	.0067858	68243	24
	24	1.0031862	4277	2952	.0000884	157336	8	.0000385	68246	3
	25	-1.0027585	-7231	+2954	-0.0158220	-157298	+38	-0.0068631	-68228	+18
	26	1.0020354	10187	2956	.0315518	157210	88	.0136859	68189	39
	27	1.0010167	13143	2956	.0472728	157072	138	.0205048	68129	60
	28	.9997024	16098	2955	.0629800	156886	186	.0273177	68046	83
	29	.9980926	19049	2951	.0786686	156650	236	.0341223	67942	104
	30	-0.9961877	-1997	+2948	-0.0943336	-156366	+284	-0.0409165	-67817	+125
Oct.	1	-0.9939880	-21997	+2942	-0.1099702	-156366	+333	-0.0476982	-67817	+145

SUN'S CO-ORDINATES, 1935

Date		MEAN EQUATOR AND EQUINOX OF 1935.0								
		X			Y			Z		
Oct.	1	-0.9939880	+24939	+2942	-0.1099702	-156033	+333	-0.0476982	-67672	+145
	2	.9914941	27875	2936	.1255735	155651	382	.0544654	67505	167
	3	.9887066	30800	2925	.1411386	155220	431	.0612159	67317	188
	4	.9856266	33717	2917	.1566606	154743	477	.0679476	67110	207
	5	.9822549	36622	2905	.1721349	154219	524	.0746586	66881	229
	6	-0.9785927	+39515	+2893	-0.1875568	-153649	+570	-0.0813467	-66634	+247
	7	.9746412	42395	2880	.2029217	153033	616	.0880101	66368	266
	8	.9704017	45261	2866	.2182250	152374	659	.0946469	66083	285
	9	.9658756	48112	2851	.2334624	151672	702	.1012552	65779	304
	10	.9610644	50952	2840	.2486296	150927	745	.1078331	65458	321
	11	-0.9559692	+53778	+2826	-0.2637223	-150143	+784	-0.1143789	-65119	+339
	12	.9505914	56589	2811	.2787366	149318	825	.1208908	64763	356
	13	.9449325	59388	2799	.2936684	148449	869	.1273671	64388	375
	14	.9389937	62177	2789	.3085133	147540	909	.1338059	63995	393
	15	.9327760	64952	2775	.3232673	146589	951	.1402054	63584	411
	16	-0.9262808	+67713	+2761	-0.3379262	-145595	+994	-0.1465638	-63154	+430
	17	.9195095	70461	2748	.3524857	144556	1039	.1528792	62704	450
	18	.9124634	73194	2733	.3669413	143471	1085	.1591496	62234	470
	19	.9051440	75911	2717	.3812884	142344	1127	.1653730	61745	489
	20	.8975529	78610	2699	.3955228	141170	1174	.1715475	61235	510
	21	-0.8896919	+81290	+2680	-0.4096398	-139950	+1220	-0.1776710	-60706	+529
	22	.8815629	83950	2660	.4236348	138686	1264	.1837416	60156	550
	23	.8731679	86587	2637	.4375034	137377	1309	.1897572	59586	570
	24	.8645092	89201	2614	.4512411	136022	1355	.1957158	58998	588
	25	.8555891	91791	2590	.4648433	134623	1399	.2016156	58390	608
	26	-0.8464100	+94355	+2564	-0.4783056	-133179	+1444	-0.2074546	-57761	+629
	27	.8369745	96891	2536	.4916235	131690	1489	.2132307	57115	646
	28	.8272854	99399	2508	.5047925	130159	1531	.2189422	56450	665
	29	.8173455	101877	2478	.5178084	128584	1575	.2245872	55765	685
	30	.8071578	104321	2444	.5306668	126968	1616	.2301637	55063	702
	31	-0.7967257	+106735	+2414	-0.5433636	-125312	+1656	-0.2356700	-54345	+718
Nov.	1	.7860522	109115	2380	.5558948	123614	1698	.2411045	53608	737
	2	.7751407	111458	2343	.5682562	121877	1737	.2464653	52854	754
	3	.7639949	113767	2309	.5804439	120104	1773	.2517507	52085	769
	4	.7526182	116038	2271	.5924543	118295	1809	.2569592	51302	783
	5	-0.7410144	+118273	+2235	-0.6042838	-116450	+1845	-0.2620894	-50503	+799
	6	.7291871	120473	2200	.6159288	114572	1878	.2671397	49690	813
	7	.7171398	122636	2163	.6273860	112662	1910	.2721087	48863	827
	8	.7048762	124762	2126	.6386522	110720	1942	.2769950	48022	841
	9	.6924000	126855	2093	.6497242	108747	1973	.2817972	47169	853
	10	-0.6797145	+128913	+2058	-0.6605989	-106743	+2004	-0.2865141	-46301	+868
	11	.6668232	130935	2022	.6712732	104708	2035	.2911442	45419	882
	12	.6537297	132923	1988	.6817440	102641	2067	.2956861	44525	894
	13	.6404374	134876	1953	.6920081	100544	2097	.3001386	43615	910
	14	.6269498	136794	1918	.7020625	98414	2130	.3045001	42691	924
	15	-0.6132704	+138674	+1880	-0.7119039	-96250	+2164	-0.3087692	-41753	+938
	16	-0.5994030	+140430	+1843	-0.7215289	-94195	+2195	-0.3129445	-40822	+952

Date	MEAN EQUATOR AND EQUINOX OF 1935.0								
	X			Y			Z		
Nov. 16	-0.5994030	+140517	+1843	-0.7215289	-94055	+2195	-0.3129445	-40801	+952
17	.5853513	142319	1802	.7309344	91828	2227	.3170246	39833	968
18	.5711194	144081	1762	.7401172	89568	2260	.3210079	38852	981
19	.5567113	145802	1721	.7490740	87277	2291	.3248931	37858	994
20	.5421311	147479	1677	.7578017	84955	2322	.3286789	36850	1008
21	-0.5273832	+149113	+1634	-0.7662972	-82603	+2352	-0.3323639	-35827	+1023
22	.5124719	150702	1589	.7745575	80221	2382	.3359466	34794	1033
23	.4974017	152245	1543	.7825796	77811	2410	.3394260	33747	1047
24	.4821772	153739	1494	.7903607	75374	2437	.3428007	32688	1059
25	.4668033	155186	1447	.7978981	72908	2466	.3460695	31617	1071
26	-0.4512847	+156583	+1397	-0.8051889	-70417	+2491	-0.3492312	-30535	+1082
27	.4356264	157930	1347	.8122306	67902	2515	.3522847	29444	1091
28	.4198334	159225	1295	.8190208	65362	2540	.3552291	28342	1102
29	.4039109	160466	1241	.8255570	62800	2562	.3580633	27232	1110
30	.3878643	161655	1189	.8318370	60221	2579	.3607865	26112	1120
Dec. 1	-0.3716988	+162792	+1137	-0.8378591	-57621	+2600	-0.3633977	-24986	+1126
2	.3554196	163876	1084	.8436212	55005	2616	.3658963	23852	1134
3	.3390320	164908	1032	.8491217	52375	2630	.3682815	22713	1139
4	.3225412	165887	979	.8543592	49732	2643	.3705528	21569	1144
5	.3059525	166817	930	.8593324	47074	2658	.3727097	20418	1151
6	-0.2892708	+167695	+878	-0.8640398	-44404	+2670	-0.3747515	-19262	+1156
7	.2725013	168523	828	.8684802	41725	2679	.3766777	18100	1162
8	.2556490	169303	780	.8726527	39034	2691	.3784877	16935	1165
9	.2387187	170034	731	.8765561	36331	2703	.3801812	15764	1171
10	.2217153	170716	682	.8801892	33618	2713	.3817576	14587	1177
11	-0.2046437	+171350	+634	-0.8835510	-30895	+2723	-0.3832163	-13407	+1180
12	.1875087	171936	586	.8866405	28160	2735	.3845570	12220	1187
13	.1703151	172470	534	.8894565	25414	2746	.3857790	11029	1191
14	.1530681	172955	485	.8919979	22657	2757	.3868819	9833	1196
15	.1357726	173388	433	.8942636	19891	2766	.3878652	8633	1200
16	-0.1184338	+173770	+382	-0.8962527	-17115	+2776	-0.3887285	-7428	+1205
17	.1010568	174097	327	.8979642	14329	2786	.3894713	6218	1210
18	.0836471	174372	275	.8993971	11537	2792	.3900931	5005	1213
19	.0662099	174593	221	.9005508	8737	2800	.3905936	3789	1216
20	.0487506	174757	164	.9014245	5932	2805	.3909725	2571	1218
21	-0.0312749	+174868	+111	-0.9020177	-3121	+2811	-0.3912296	-1351	+1220
22	.0137881	174923	55	.9023298	306	2815	.3913647	128	1223
23	+0.037042	174919	4	.9023604	2511	2817	.3913775	1096	1224
24	.0211961	174858	61	.9021093	5331	2820	.3912679	2319	1223
25	.0386819	174741	117	.9015762	8150	2819	.3910360	3542	1223
26	+0.0561560	+174564	-177	-0.9007612	-10969	+2819	-0.3906818	-4764	+1222
27	.0736124	174329	235	.8996643	13783	2814	.3902054	5985	1221
28	.0910453	174036	293	.8982860	16591	2808	.3896069	7202	1217
29	.1084489	173684	352	.8966269	19393	2802	.3888867	8416	1214
30	.1258173	173277	407	.8946876	22185	2792	.3880451	9626	1210
31	+0.1431450	+172815	-462	-0.8924691	-24967	+2782	-0.3870825	-10829	+1203
32	+0.1604265	+172517	-517	-0.8899724	-2770	+2770	-0.3859996	-1202	+1202

SUN, 1935

MEAN EQUINOX OF 1950-0

39

Date		Longitude				Latitude		Radius Vector	
Feb.	16	326°	•60024	1°00910	36°00'9"	— 0°00094	— 3'4"	0·987 9240	+2013
	17	327	•60934	•00867	36°33'6"	•00095	3'4"	•988 1253	2060
	18	328	•61801	•00823	37°04'8"	•00095	3'4"	•988 3313	2107
	19	329	•62624	•00780	37°34'4"	•00095	3'4"	•988 5420	2154
	20	330	•63404	•00739	38°02'5"	•00095	3'4"	•988 7574	2199
	21	331	•64143	1°00697	38°29'1"	— 0°00094	— 3'4"	0·988 9773	+2242
	22	332	•64840	•00657	38°54'2"	•00092	3'3"	•989 2015	2285
	23	333	•65497	•00617	39°17'9"	•00090	3'2"	•989 4300	2325
	24	334	•66114	•00577	39°40'1"	•00086	3'1"	•989 6625	2362
	25	335	•66691	•00537	40°00'9"	•00082	3'0"	•989 8987	2395
Mar.	26	336	•67228	1°00498	40°20'2"	— 0°00077	— 2'8"	0·990 1382	+2426
	27	337	•67726	•00459	40°38'1"	•00071	2'6"	•990 3808	2453
	28	338	•68185	•00418	40°54'7"	•00065	2'3"	•990 6261	2476
	1	339	•68603	•00377	41°09'7"	•00058	2'1"	•990 8737	2494
	2	340	•68980	•00333	41°23'3"	•00051	1'8"	•991 1231	2509
	3	341	•69313	1°00288	41°35'3"	— 0°00044	— 1'6"	0·991 3740	+2520
	4	342	•69601	•00239	41°45'6"	•00036	1'3"	•991 6260	2530
	5	343	•69840	•00188	41°54'2"	•00030	1'1"	•991 8790	2537
	6	344	•70028	•00135	42°01'0"	•00024	0'9"	•992 1327	2546
	7	345	•70163	•00078	42°05'9"	•00019	0'7"	•992 3873	2553
	8	346	•70241	1°00021	42°08'7"	— 0°00015	— 0'5"	0·992 6426	+2563
	9	347	•70262	0°99961	42°09'4"	•00011	0'4"	•992 8989	2575
	10	348	•70223	•99900	42°08'0"	•00009	0'3"	•993 1564	2590
	11	349	•70123	•99838	42°04'4"	•00007	0'2"	•993 4154	2605
	12	350	•69961	•99777	41°58'6"	•00006	0'2"	•993 6759	2625
	13	351	•69738	0°99716	41°50'6"	— 0°00005	— 0'2"	0·993 9384	+2644
	14	352	•69454	•99654	41°40'3"	•00005	0'2"	•994 2028	2666
	15	353	•69108	•99593	41°27'9"	•00004	0'2"	•994 4694	2688
	16	354	•68701	•99533	41°13'2"	•00005	0'2"	•994 7382	2712
	17	355	•68234	•99474	40°56'4"	•00005	0'2"	•995 0094	2735
	18	356	•67708	0°99416	40°37'5"	— 0°00005	— 0'2"	0·995 2829	+2760
	19	357	•67124	•99359	40°16'5"	•00004	0'2"	•995 5589	2784
	20	358	•66483	•99302	39°53'4"	•00003	— 0'1"	•995 8373	2809
	21	359	•65785	•99247	39°28'3"	— 0°00001	0'0"	•996 1182	2831
	22	0	•65032	•99193	39°01'1"	+ 0°00002	+ 0'1"	•996 4013	2854
	23	1	•64225	0°99141	38°32'1"	+ 0°00005	+ 0'2"	0·996 6867	+2874
	24	2	•63366	•99091	38°01'2"	•00009	0'3"	•996 9741	2893
	25	3	•62457	•99040	37°28'4"	•00014	0'5"	•997 2634	2907
	26	4	•61497	•98991	36°53'9"	•00019	0'7"	•997 5541	2919
	27	5	•60488	•98943	36°17'6"	•00026	0'9"	•997 8460	2928
	28	6	•59431	0°98895	35°39'5"	+ 0°00033	+ 1'2"	0·998 1388	+2931
	29	7	•58326	•98846	34°59'7"	•00039	1'4"	•998 4319	2932
	30	8	•57172	•98798	34°18'2"	•00046	1'7"	•998 7251	2928
	31	9	•55970	•98747	33°34'9"	•00053	1'9"	•999 0179	2919
Apr.	1	10	•54717	•98696	32°49'8"	•00060	2'1"	•999 3098	2908
	2	11	•53413	0°98643	32°02'9"	+ 0°00065	+ 2'3"	0·999 6006	+2894
	3	12	•52056		31°14'0"	+ 0°00070	+ 2'5"	0·999 8900	

MEAN EQUINOX OF 1950.0

Date		Longitude				Latitude		Radius Vector		
Apr.	1	10°	•54717	0°98696	32°49'8"	3553.1	+ 0.00060	+ 2.1	0.999 3098	+2908
	2	11	•53413	•98643	32°02'9"	3551.1	•00065	2.3	•999 6006	2894
	3	12	•52056	•98586	31°14'0"	3549.1	•00070	2.5	0.999 8900	2879
	4	13	•50642	•98529	30°23'1"	3547.1	•00074	2.7	1.000 1779	2861
	5	14	•49171	•98470	29°30'2"	3544.9	•00078	2.8	•000 4640	2845
	6	15	•47641	0°98408	28°35'1"	3542.7	+ 0.00080	+ 2.9	1.000 7485	+2830
	7	16	•46049	•98346	27°37'8"	3540.4	•00082	2.9	•001 0315	2816
	8	17	•44395	•98282	26°38'2"	3538.2	•00083	3.0	•001 3131	2804
	9	18	•42677	•98219	25°36'4"	3535.9	•00083	3.0	•001 5935	2795
	10	19	•40896	•98156	24°32'3"	3533.6	•00083	3.0	•001 8730	2787
	11	20	•39052	0°98093	23°25'9"	3531.3	+ 0.00083	+ 3.0	1.002 1517	+2781
	12	21	•37145	•98030	22°17'2"	3529.1	•00082	3.0	•002 4298	2776
	13	22	•35175	•97968	21°06'3"	3526.8	•00082	2.9	•002 7074	2772
	14	23	•33143	•97907	19°53'1"	3524.7	•00081	2.9	•002 9846	2770
	15	24	•31050	•97848	18°37'8"	3522.5	•00082	2.9	•003 2616	2768
	16	25	•28898	0°97789	17°20'3"	3520.4	+ 0.00083	+ 3.0	1.003 5384	+2767
	17	26	•26687	•97732	16°00'7"	3518.4	•00084	3.0	•003 8151	2767
	18	27	•24419	•97676	14°39'1"	3516.3	•00086	3.1	•004 0918	2767
	19	28	•22095	•97623	13°15'4"	3514.4	•00088	3.2	•004 3685	2767
	20	29	•19718	•97571	11°49'8"	3512.6	•00092	3.3	•004 6452	2766
	21	30	•17289	0°97522	10°22'4"	3510.8	+ 0.00096	+ 3.5	1.004 9218	+2763
	22	31	•14811	•97474	08°53'2"	3509.0	•00101	3.6	•005 1981	2758
	23	32	•12285	•97427	07°22'2"	3507.4	•00106	3.8	•005 4739	2751
	24	33	•09712	•97383	05°49'6"	3505.8	•00112	4.0	•005 7490	2740
	25	34	•07095	•97339	04°15'4"	3504.2	•00118	4.3	•006 0230	2726
	26	35	•04434	0°97298	02°39'6"	3502.7	+ 0.00125	+ 4.5	1.006 2956	+2707
	27	36	•01732	•97255	01°02'3"	3501.2	•00131	4.7	•006 5663	2685
	28	36	•98987	•97212	59°23'5"	3499.7	•00137	4.9	•006 8348	2658
	29	37	•96199	•97170	57°43'2"	3498.1	•00142	5.1	•007 1006	2628
	30	38	•93369	•97125	56°01'3"	3496.5	•00146	5.3	•007 3634	2593
May	1	39	•90494	0°97081	54°17'8"	3494.9	+ 0.00149	+ 5.4	1.007 6227	+2557
	2	40	•87575	•97034	52°32'7"	3493.2	•00152	5.5	•007 8784	2519
	3	41	•84609	•96985	50°45'9"	3491.5	•00154	5.5	•008 1303	2480
	4	42	•81594	•96936	48°57'4"	3489.7	•00155	5.6	•008 3783	2441
	5	43	•78530	•96885	47°07'1"	3487.8	•00155	5.6	•008 6224	2403
	6	44	•75415	0°96833	45°14'9"	3486.0	+ 0.00154	+ 5.5	1.008 8627	+2365
	7	45	•72248	•96782	43°20'9"	3484.2	•00153	5.5	•009 0992	2331
	8	46	•69030	•96729	41°25'1"	3482.2	•00152	5.5	•009 3323	2297
	9	47	•65759	•96678	39°27'3"	3480.4	•00151	5.4	•009 5620	2266
	10	48	•62437	•96625	37°27'7"	3478.5	•00149	5.4	•009 7886	2236
	11	49	•59062	0°96575	35°26'2"	3476.7	+ 0.00148	+ 5.3	1.010 0122	+2207
	12	50	•55637	•96525	33°22'9"	3474.9	•00147	5.3	•010 2329	2181
	13	51	•52162	•96476	31°17'8"	3473.2	•00147	5.3	•010 4510	2156
	14	52	•48638	•96429	29°11'0"	3471.4	•00147	5.3	•010 6666	2132
	15	53	•45067	•96382	27°02'4"	3469.8	•00148	5.3	•010 8798	2109
	16	54	•41449	0°96338	24°52'2"	3468.1	+ 0.00149	+ 5.4	1.011 0907	+2089
	17	55	•37787		22°40'3"		+ 0.00152	+ 5.5	1.011 2996	

SUN, 1935

MEAN EQUINOX OF 1950-0

41

Date		Longitude				Latitude		Radius Vector		
May	17	55	•37787	0°56296	22 40.3	3466.7	+ 0.00152	+ 5.5	1.011 2996	
	18	56	•34083	•96256	20 27.0	3465.2	•00155	5.6	•011 5065	+2069
	19	57	•30339	•96217	18 12.2	3463.8	•00158	5.7	•011 7113	2048
	20	58	•26556	•96183	15 56.0	3462.6	•00163	5.9	•011 9142	2029
	21	59	•22739	•96151	13 38.6	3461.4	•00168	6.0	•012 1150	2008
	22	60	•18890	0°96119	11 20.0	3460.3	+ 0.00173	+ 6.2	1.012 3135	1985
	23	61	•15009	•96092	09 00.3	3459.3	•00178	6.4	•012 5094	+1959
	24	62	•11101	•96065	06 39.6	3458.4	•00182	6.6	•012 7024	1930
	25	63	•07166	•96038	04 18.0	3457.4	•00187	6.7	•012 8922	1898
	26	64	•03204	•96014	01 55.4	3456.4	•00191	6.9	•013 0785	1863
	27	64	•99218	0°95989	59 31.8	3455.6	+ 0.00194	+ 7.0	1.013 2607	1822
	28	65	•95207	•95964	57 07.4	3454.7	•00197	7.1	•013 4385	+1778
	29	66	•91171	•95938	54 42.1	3453.8	•00198	7.1	•013 6116	1731
	30	67	•87109	•95912	52 15.9	3452.8	•00199	7.1	•013 7797	1681
	31	68	•83021	•95884	49 48.7	3451.9	•00198	7.1	•013 9425	1628
June	1	69	•78905	0°95856	47 20.6	3450.8	+ 0.00197	+ 7.1	1.014 0999	1574
	2	70	•74761	•95826	44 51.4	3449.7	•00195	7.0	•014 2519	+1520
	3	71	•70587	•95796	42 21.1	3448.7	•00193	6.9	•014 3983	1464
	4	72	•66383	•95765	39 49.8	3447.5	•00190	6.8	•014 5394	1411
	5	73	•62148	•95734	37 17.3	3446.4	•00187	6.7	•014 6751	1357
	6	74	•57882	0°95703	34 43.7	3445.3	+ 0.00185	+ 6.6	1.014 8057	1306
	7	75	•53585	•95672	32 09.0	3444.2	•00182	6.5	•014 9312	+1255
	8	76	•49257	•95641	29 33.2	3443.1	•00179	6.5	•015 0520	1208
	9	77	•44898	•95612	26 56.3	3442.0	•00178	6.4	•015 1682	1162
	10	78	•40510	•95582	24 18.3	3441.0	•00176	6.3	•015 2800	1118
	11	79	•36092	0°95555	21 39.3	3440.0	+ 0.00176	+ 6.3	1.015 3875	1075
	12	80	•31647	•95529	18 59.3	3439.0	•00176	6.3	•015 4910	+1035
	13	81	•27176	•95502	16 18.3	3438.1	•00176	6.3	•015 5907	997
	14	82	•22678	•95480	13 36.4	3437.3	•00178	6.4	•015 6868	961
	15	83	•18158	•95459	10 53.7	3436.5	•00180	6.5	•015 7795	927
	16	84	•13617	0°95441	08 10.2	3435.9	+ 0.00183	+ 6.6	1.015 8690	895
	17	85	•09058	•95424	05 26.1	3435.3	•00186	6.7	•015 9553	+ 863
	18	86	•04482	•95412	02 41.4	3434.8	•00189	6.8	•016 0386	833
	19	86	•99894	•95403	59 56.2	3434.5	•00193	6.9	•016 1188	802
	20	87	•95297	•95395	57 10.7	3434.2	•00197	7.1	•016 1956	768
	21	88	•90692	0°95390	54 24.9	3434.0	+ 0.00200	+ 7.2	1.016 2689	733
	22	89	•86082	•95386	51 38.9	3433.9	•00203	7.3	•016 3384	+ 695
	23	90	•81468	•95385	48 52.8	3433.9	•00206	7.4	•016 4037	653
	24	91	•76853	•95383	46 06.7	3433.8	•00207	7.4	•016 4646	609
	25	92	•72236	•95383	43 20.5	3433.8	•00207	7.4	•016 5206	560
	26	93	•67619	0°95382	40 34.3	3433.7	+ 0.00206	+ 7.4	1.016 5715	509
	27	94	•63001	•95380	37 48.0	3433.7	•00205	7.4	•016 6168	+ 453
	28	95	•58381	•95379	35 01.7	3433.7	•00203	7.3	•016 6564	396
	29	96	•53760	•95377	32 15.4	3433.5	•00199	7.2	•016 6901	337
	30	97	•49137	•95373	29 28.9	3433.5	•00195	7.0	•016 7178	277
July	1	98	•44510	0°95370	26 42.4	3433.3	+ 0.00191	+ 6.9	1.016 7393	215
	2	99	•39880		23 55.7		+ 0.00186	+ 6.7	1.016 7547	+ 154

(330/3544)

(NAUTICAL ALMANAC, 1935)

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SUN, 1935

MEAN EQUINOX OF 1950.0

Date		Longitude				Latitude		Radius Vector		
July	1	98	•44510	0°95370	26 42.4	3433.3	+ 0.00191	+ 6.9	I-016 7393	+ 154
	2	99	•39880	•95366	23 55.7	3433.1	•00186	6.7	•016 7547	94
	3	100	•35246	•95360	21 08.8	3433.0	•00182	6.6	•016 7641	+ 34
	4	101	•30606	•95355	18 21.8	3432.8	•00178	6.4	•016 7675	- 24
	5	102	•25961	•95350	15 34.6	3432.6	•00174	6.3	•016 7651	81
	6	103	•21311	0°95346	12 47.2	3432.4	+ 0.00170	+ 6.1	I-016 7570	- 135
	7	104	•16657	•95341	09 59.6	3432.3	•00167	6.0	•016 7435	187
	8	105	•11998	•95336	07 11.9	3432.1	•00165	5.9	•016 7248	238
	9	106	•07334	•95333	04 24.0	3432.0	•00163	5.9	•016 7010	285
	10	107	•02667	•95330	01 36.0	3431.9	•00162	5.8	•016 6725	331
	11	107	•97997	0°95328	58 47.9	3431.8	+ 0.00162	+ 5.8	I-016 6394	- 373
	12	108	•93325	•95328	55 59.7	3431.8	•00163	5.9	•016 6021	413
	13	109	•88653	•95329	53 11.5	3431.9	•00164	5.9	•016 5608	450
	14	110	•83982	•95334	50 23.4	3432.0	•00166	6.0	•016 5158	484
	15	111	•79316	•95340	47 35.4	3432.2	•00168	6.0	•016 4674	516
	16	112	•74656	0°95350	44 47.6	3432.6	+ 0.00170	+ 6.1	I-016 4158	- 549
	17	113	•70006	•95362	42 00.2	3433.0	•00172	6.2	•016 3609	580
	18	114	•65368	•95378	39 13.2	3433.6	•00174	6.3	•016 3029	613
	19	115	•60746	•95396	36 26.8	3434.3	•00176	6.3	•016 2416	647
	20	116	•56142	•95416	33 41.1	3435.0	•00177	6.4	•016 1769	684
	21	117	•51558	0°95439	30 56.1	3435.8	+ 0.00177	+ 6.4	I-016 1085	- 724
	22	118	•46997	•95463	28 11.9	3436.7	•00176	6.3	•016 0361	767
	23	119	•42460	•95488	25 28.6	3437.5	•00175	6.3	•015 9594	814
	24	120	•37948	•95512	22 46.1	3438.4	•00172	6.2	•015 8780	863
	25	121	•33460	•95537	20 04.5	3439.4	•00168	6.1	•015 7917	915
	26	122	•28997	0°95562	17 23.9	3440.2	+ 0.00164	+ 5.9	I-015 7002	- 969
	27	123	•24559	•95587	14 44.1	3441.1	•00159	5.7	•015 6033	1025
	28	124	•20146	•95611	12 05.2	3442.0	•00153	5.5	•015 5008	1081
	29	125	•15757	•95633	09 27.2	3442.8	•00148	5.3	•015 3927	1138
	30	126	•11390	•95656	06 50.0	3443.7	•00142	5.1	•015 2789	1194
Aug.	31	127	•07046	0°95678	04 13.7	3444.4	+ 0.00136	+ 4.9	I-015 1595	- 1251
	1	128	•02724	•95700	01 38.1	3445.2	•00131	4.7	•015 0344	1305
	2	128	•98424	•95720	59 03.3	3445.9	•00126	4.5	•014 9039	1359
	3	129	•94144	•95742	56 29.2	3446.7	•00122	4.4	•014 7680	1411
	4	130	•89886	•95762	53 55.9	3447.4	•00118	4.2	•014 6269	1462
	5	131	•85648	0°95783	51 23.3	3448.2	+ 0.00115	+ 4.1	I-014 4807	- 1510
	6	132	•81431	•95804	48 51.5	3448.9	•00113	4.1	•014 3297	1555
	7	133	•77235	•95824	46 20.4	3449.7	•00111	4.0	•014 1742	1597
	8	134	•73059	•95847	43 50.1	3450.5	•00110	4.0	•014 0145	1638
	9	135	•68906	•95869	41 20.6	3451.3	•00110	4.0	•013 8507	1674
	10	136	•64775	0°95893	38 51.9	3452.1	+ 0.00110	+ 4.0	I-013 6833	- 1706
	11	137	•60668	•95917	36 24.0	3453.1	•00111	4.0	•013 5127	1736
	12	138	•56585	•95945	33 57.1	3454.0	•00113	4.1	•013 3391	1763
	13	139	•52530	•95975	31 31.1	3455.1	•00114	4.1	•013 1628	1786
	14	140	•48505	•96008	29 06.2	3456.3	•00115	4.1	•012 9842	1808
	15	141	•44513	0°96044	26 42.5	3457.5	+ 0.00116	+ 4.2	I-012 8034	- 1829
16	142	•40557		24 20.0		+ 0.00116	+ 4.2	I-012 6205		

MEAN EQUINOX OF 1950.0

Date		Longitude				Latitude		Radius Vector			
Aug.	16	I42	·40557	°	24 20.0	+	0.00116	+	4.2	I.012 6205	—1852
	17	I43	·36639	°	21 59.0		0.00115		4.1	·012 4353	1875
	18	I44	·32762	°	19 39.4		0.00114		4.1	·012 2478	1901
	19	I45	·28929	°	17 21.5		0.00111		4.0	·012 0577	1929
	20	I46	·25142	°	15 05.1		0.00108		3.9	·011 8648	1960
	21	I47	·21401	°	12 50.4	+	0.00104	+	3.7	I.011 6688	—1994
	22	I48	·17707	°	10 37.4		0.00099		3.6	·011 4694	2030
	23	I49	·14061	°	08 26.2		0.00093		3.4	·011 2664	2068
	24	I50	·10462	°	06 16.6		0.00087		3.1	·011 0596	2109
	25	I51	·06910	°	04 08.8		0.00080		2.9	·010 8487	2151
	26	I52	·03406	°	02 02.6	+	0.00074	+	2.7	I.010 6336	—2192
	27	I52	·99947	°	59 58.1		0.00068		2.4	·010 4144	2235
	28	I53	·96533	°	57 55.2		0.00062		2.2	·010 1909	2276
	29	I54	·93164	°	55 53.9		0.00056		2.0	·009 9633	2319
	30	I55	·89840	°	53 54.2		0.00050		1.8	·009 7314	2360
	31	I56	·86559	°	51 56.1	+	0.00046	+	1.6	I.009 4954	—2399
	1	I57	·83320	°	49 59.5		0.00042		1.5	·009 2555	2437
	2	I58	·80123	°	48 04.4		0.00039		1.4	·009 0118	2474
	3	I59	·76967	°	46 10.8		0.00036		1.3	·008 7644	2507
	4	I60	·73853	°	44 18.7		0.00034		1.2	·008 5137	2538
	5	I61	·70778	°	42 28.0	+	0.00033	+	1.2	I.008 2599	—2566
	6	I62	·67744	°	40 38.8		0.00033		1.2	·008 0033	2590
	7	I63	·64751	°	38 51.0		0.00033		1.2	·007 7443	2611
	8	I64	·61798	°	37 04.7		0.00034		1.2	·007 4832	2627
	9	I65	·58887	°	35 19.9		0.00034		1.2	·007 2205	2641
	10	I66	·56018	°	33 36.7	+	0.00035	+	1.3	I.006 9564	—2650
	11	I67	·53194	°	31 55.0		0.00035		1.3	·006 6914	2656
	12	I68	·50417	°	30 15.0		0.00035		1.3	·006 4258	2660
	13	I69	·47689	°	28 36.8		0.00034		1.2	·006 1598	2663
	14	I70	·45012	°	27 00.4		0.00033		1.2	·005 8935	2666
	15	I71	·42390	°	25 26.0	+	0.00030	+	1.1	I.005 6269	—2669
	16	I72	·39825	°	23 53.7		0.00026		0.9	·005 3600	2675
	17	I73	·37319	°	22 23.5		0.00022		0.8	·005 0925	2682
	18	I74	·34873	°	20 55.4		0.00017		0.6	·004 8243	2692
	19	I75	·32489	°	19 29.6		0.00011		0.4	·004 5551	2706
	20	I76	·30167	°	18 06.0	+	0.00005	+	0.2	I.004 2845	—2720
	21	I77	·27907	°	16 44.6	—	0.00002	—	0.1	·004 0125	2736
	22	I78	·25709	°	15 25.5		0.00008		0.3	·003 7389	2754
	23	I79	·23571	°	14 08.6		0.00015		0.5	·003 4635	2774
	24	I80	·21495	°	12 53.8		0.00021		0.8	·003 1861	2793
	25	I81	·19478	°	11 41.2	—	0.00027	—	1.0	I.002 9068	—2814
	26	I82	·17520	°	10 30.7		0.00032		1.2	·002 6254	2833
	27	I83	·15620	°	09 22.3		0.00037		1.3	·002 3421	2854
	28	I84	·13776	°	08 16.0		0.00041		1.5	·002 0567	2873
	29	I85	·11989	°	07 11.6		0.00044		1.6	·001 7694	2891
	30	I86	·10256	°	06 09.2	—	0.00047	—	1.7	I.001 4803	—2907
	Oct. 1	I87	·08576	°	05 08.8	—	0.00048	—	1.7	I.001 1896	

MEAN EQUINOX OF 1950.0

Date		Longitude				Latitude		Radius Vector	
Oct.	1	187	08576	098373	05 08.8	0.00048	1.7	1.001 1896	-2922
	2	188	06949	08423	04 10.2	0.0049	1.8	0.000 8974	2934
	3	189	05372	08474	03 13.4	0.0050	1.8	0.000 6040	2944
	4	190	03846	08522	02 18.4	0.0050	1.8	0.000 3096	2951
	5	191	02368	08571	01 25.3	0.0049	1.8	1.000 0145	2953
	6	192	00939	098620	00 33.8	0.00048	1.7	0.999 7192	-2951
	7	192	99559	08670	59 44.1	0.0048	1.7	0.999 4241	2946
	8	193	98229	08718	58 56.2	0.0047	1.7	0.999 1295	2937
	9	194	96947	08768	58 10.1	0.0047	1.7	0.998 8358	2922
	10	195	95715	08822	57 25.8	0.0048	1.7	0.998 5436	2906
	11	196	94537	098875	56 43.3	0.00049	1.8	0.998 2530	-2887
	12	197	93412	08932	56 02.8	0.0051	1.8	0.997 9643	2866
	13	198	92344	08990	55 24.4	0.0054	2.0	0.997 6777	2843
	14	199	91334	09050	54 48.0	0.0058	2.1	0.997 3934	2823
	15	200	90384	09113	54 13.8	0.0063	2.3	0.997 1111	2804
	16	201	89497	099177	53 41.9	0.00068	2.5	0.996 8307	-2786
	17	202	88674	09240	53 12.3	0.0074	2.7	0.996 5521	2770
	18	203	87914	09304	52 44.9	0.0080	2.9	0.996 2751	2757
	19	204	87218	09369	52 19.9	0.0086	3.1	0.995 9994	2746
	20	205	86587	09432	51 57.1	0.0092	3.3	0.995 7248	2735
	21	206	86019	099494	51 36.7	0.00098	3.5	0.995 4513	-2727
	22	207	85513	09556	51 18.5	0.0104	3.7	0.995 1786	2720
	23	208	85069	09618	51 02.5	0.0108	3.9	0.994 9066	2713
	24	209	84687	09677	50 48.7	0.0113	4.1	0.994 6353	2708
	25	210	84364	09734	50 37.1	0.0116	4.2	0.994 3645	2702
	26	211	84098	099791	50 27.5	0.00119	4.3	0.994 0943	-2697
	27	212	83889	09847	50 20.0	0.0121	4.4	0.993 8246	2692
	28	213	83736	09899	50 14.5	0.0122	4.4	0.993 5554	2686
	29	214	83635	09950	50 10.9	0.0123	4.4	0.993 2868	2679
	30	215	83585	1.00000	50 09.1	0.0123	4.4	0.993 0189	2670
	31	216	83585	1.00048	50 09.1	0.00122	4.4	0.992 7519	-2659
Nov.	1	217	83633	00093	50 10.8	0.0121	4.4	0.992 4860	2646
	2	218	83726	00138	50 14.1	0.0119	4.3	0.992 2214	2628
	3	219	83864	00181	50 19.1	0.0118	4.2	0.991 9586	2608
	4	220	84045	00223	50 25.6	0.0116	4.2	0.991 6978	2584
	5	221	84268	1.00266	50 33.6	0.00116	4.2	0.991 4394	-2554
	6	222	84534	00308	50 43.2	0.0115	4.2	0.991 1840	2522
	7	223	84842	00350	50 54.3	0.0116	4.2	0.990 9318	2486
	8	224	85192	00395	51 06.9	0.0117	4.2	0.990 6832	2445
	9	225	85587	00440	51 21.1	0.0119	4.3	0.990 4387	2403
	10	226	86027	1.00486	51 37.0	0.00122	4.4	0.990 1984	-2359
	11	227	86513	00534	51 54.5	0.0126	4.5	0.989 9625	2314
	12	228	87047	00584	52 13.7	0.0130	4.7	0.989 7311	2269
	13	229	87631	00635	52 34.7	0.0135	4.9	0.989 5042	2226
	14	230	88266	00686	52 57.6	0.0140	5.0	0.989 2816	2183
	15	231	88952	1.00738	53 22.3	0.00146	5.2	0.989 0633	-2143
	16	232	89690		53 48.8	0.00151	5.4	0.988 8490	

SUN, 1935

MEAN EQUINOX OF 1950.0

45

Date	Longitude				Latitude		Radius Vector		
Nov.	16	232	° 89690	° 1.00790	53 48.8	— 0.00151	— 5.4	0.988 8490	— 2105
	17	233	° 90480	° 0.00842	54 17.3	° 0.00156	5.6	° 988 6385	2069
	18	234	° 91322	° 0.00892	54 47.6	° 0.00161	5.8	° 988 4316	2034
	19	235	° 92214	° 0.00941	55 19.7	° 0.00165	5.9	° 988 2282	2002
	20	236	° 93155	° 0.00990	55 53.6	° 0.00168	6.0	° 988 0280	1970
	21	237	° 94145	° 0.01037	56 29.2	— 0.00171	— 6.1	0.987 8310	— 1940
	22	238	° 95182	° 0.01083	57 06.6	° 0.00172	6.2	° 987 6370	1911
	23	239	° 96265	° 0.01128	57 45.5	° 0.00173	6.2	° 987 4459	1884
	24	240	° 97393	° 0.01168	58 26.1	° 0.00174	6.2	° 987 2575	1857
	25	241	° 98561	° 0.01209	59 08.2	° 0.00173	6.2	° 987 0718	1830
	26	242	° 99770	° 0.01246	59 51.7	— 0.00172	— 6.2	0.986 8888	— 1804
	27	244	° 01016	° 0.01282	00 36.6	° 0.00170	6.1	° 986 7084	1778
	28	245	° 02298	° 0.01314	01 22.7	° 0.00168	6.0	° 986 5306	1749
	29	246	° 03612	° 0.01344	02 10.0	° 0.00165	5.9	° 986 3557	1720
	30	247	° 04956	° 0.01371	02 58.4	° 0.00162	5.8	° 986 1837	1687
Dec.	1	248	° 06327	° 0.01397	03 47.8	— 0.00160	— 5.8	0.986 0150	— 1652
	2	249	° 07724	° 0.01421	04 38.1	° 0.00157	5.7	° 985 8498	1614
	3	250	° 09145	° 0.01444	05 29.2	° 0.00156	5.6	° 985 6884	1571
	4	251	° 10589	° 0.01466	06 21.2	° 0.00154	5.6	° 985 5313	1524
	5	252	° 12055	° 0.01487	07 14.0	° 0.00154	5.6	° 985 3789	1475
	6	253	° 13542	° 0.01509	08 07.5	— 0.00155	— 5.6	0.985 2314	— 1421
	7	254	° 15051	° 0.01530	09 01.8	° 0.00156	5.6	° 985 0893	1365
	8	255	° 16581	° 0.01553	09 56.9	° 0.00159	5.7	° 984 9528	1306
	9	256	° 18134	° 0.01577	10 52.8	° 0.00162	5.8	° 984 8222	1246
	10	257	° 19711	° 0.01601	11 49.6	° 0.00166	6.0	° 984 6976	1185
	11	258	° 21312	° 0.01627	12 47.2	— 0.00169	— 6.1	0.984 5791	— 1123
	12	259	° 22939	° 0.01653	13 45.8	° 0.00173	6.2	° 984 4668	1064
	13	260	° 24592	° 0.01680	14 45.3	° 0.00178	6.4	° 984 3604	1005
	14	261	° 26272	° 0.01707	15 45.8	° 0.00181	6.5	° 984 2599	948
	15	262	° 27979	° 0.01734	16 47.2	° 0.00185	6.6	° 984 1651	893
	16	263	° 29713	° 0.01759	17 49.6	— 0.00187	— 6.7	0.984 0758	— 840
	17	264	° 31472	° 0.01785	18 53.0	° 0.00190	6.8	° 983 9918	790
	18	265	° 33257	° 0.01809	19 57.3	° 0.00191	6.9	° 983 9128	741
	19	266	° 35066	° 0.01833	21 02.4	° 0.00192	6.9	° 983 8387	694
	20	267	° 36899	° 0.01854	22 08.4	° 0.00191	6.9	° 983 7693	649
	21	268	° 38753	° 0.01875	23 15.1	— 0.00191	— 6.9	0.983 7044	— 605
	22	269	° 40628	° 0.01893	24 22.6	° 0.00189	6.8	° 983 6439	564
	23	270	° 42521	° 0.01910	25 30.8	° 0.00186	6.7	° 983 5875	525
	24	271	° 44431	° 0.01924	26 39.5	° 0.00183	6.6	° 983 5350	488
	25	272	° 46355	° 0.01935	27 48.8	° 0.00179	6.4	° 983 4862	451
	26	273	° 48290	° 0.01943	28 58.4	— 0.00174	— 6.3	0.983 4411	— 414
	27	274	° 50233	° 0.01949	30 08.4	° 0.00170	6.1	° 983 3997	378
	28	275	° 52182	° 0.01951	31 18.6	° 0.00166	6.0	° 983 3619	339
	29	276	° 54133	° 0.01951	32 28.8	° 0.00162	5.8	° 983 3280	299
	30	277	° 56084	° 0.01948	33 39.0	° 0.00159	5.7	° 983 2981	257
	31	278	° 58032	° 0.01944	34 49.2	— 0.00156	— 5.6	0.983 2724	— 211
	32	279	° 59976	° 0.01944	35 59.1	— 0.00154	— 5.5	0.983 2513	

SUN'S CO-ORDINATES, 1935

Date		MEAN EQUATOR AND EQUINOX OF 1950.0								
		X			Y			Z		
Jan.	1	+0.1683103		- 511	-0.8887919	+ 28911	+2777	-0.3854968	+ 12543	+1205
	2	.1855210	+172107	568	.8859008	31681	2770	.3842425	13745	1202
	3	.2026749	171539	626	.8827327	34444	2763	.3828680	14946	1201
	4	.2197662	170913	682	.8792883	37197	2753	.3813734	16141	1195
	5	.2367893	170231	741	.8755686	39938	2741	.3797593	17330	1189
	6	+0.2537383		- 798	-0.8715748	+ 42665	+2727	-0.3780263	+ 18513	+1183
	7	.2706075	+168692	854	.8673083	45378	2713	.3761750	19689	1176
	8	.2873913	167838	909	.8627705	48072	2694	.3742061	20857	1168
	9	.3040842	166929	964	.8579633	50748	2676	.3721204	22017	1160
	10	.3206807	165965	1015	.8528885	53401	2656	.3699187	23167	1150
			164950							
	11	+0.3371757		-1066	-0.8475481	+ 56038	+2634	-0.3676020	+ 24309	+1142
	12	.3535641	+163884	1115	.8419443	58653	2615	.3651711	25440	1131
	13	.3698410	162769	1164	.8360790	61241	2591	.3626271	26563	1123
	14	.3860015	161605	1212	.8299546	63815	2571	.3599708	27676	1113
	15	.4020408	160393	1258	.8235731	66363	2548	.3572032	28781	1105
			159135							
	16	+0.4179543		-1302	-0.8169368	+ 68890	+2527	-0.3543251	+ 29874	+1093
	17	.4337376	+157833	1350	.8100478	71395	2505	.3513377	30960	1086
	18	.4493859	156483	1395	.8029083	73875	2480	.3482417	32036	1076
	19	.4648947	155088	1438	.7952208	76334	2459	.3450381	33102	1066
	20	.4802597	153650	1483	.7878874	78770	2436	.3417479	34159	1057
			152167							
	21	+0.4954764		-1529	-0.7800104	+ 81183	+2413	-0.3383120	+ 35205	+1046
	22	.5105402	+150638	1572	.7718921	83571	2388	.3347915	36242	1037
	23	.5254468	149066	1617	.7635350	85936	2365	.3311673	37268	1026
	24	.5401917	147449	1662	.7549414	88275	2339	.3274405	38284	1016
	25	.5547704	145787	1706	.7461139	90588	2313	.3236121	39289	1005
			144081							
	26	+0.5691785		-1749	-0.7370551	+ 92877	+2281	-0.3196832	+ 40283	+ 994
	27	.5834117	+142332	1794	.7277674	95138	2261	.3156549	41265	982
	28	.5974655	140538	1837	.7182536	97372	2234	.3115284	42236	971
	29	.6113356	138701	1884	.7085164	99577	2205	.3073048	43194	958
	30	.6250173	136817	1928	.6985587	101753	2176	.3029854	44139	945
			134889							
Feb.	31	+0.6385062		-1973	-0.6883834	+ 103809	+2146	-0.2985715	+ 45071	+ 932
	1	.6517978	+132916	2016	.6779935	106013	2114	.2940644	45988	917
	2	.6648878	130900	2062	.6673922	108091	2078	.2894656	46890	902
	3	.6777716	128838	2104	.6565831	110135	2044	.2847766	47776	886
	4	.6904450	126734	2148	.6455696	112140	2005	.2799990	48645	869
			124586							
	5	+0.7029036		-2186	-0.6343556	+ 114105	+1965	-0.2751345	+ 49497	+ 852
	6	.7151436	+122400	2224	.6229451	116032	1927	.2701848	50331	834
	7	.7271612	120176	2261	.6113419	117916	1884	.2651517	51148	817
	8	.7389527	117915	2295	.5995503	119760	1844	.2600369	51945	797
	9	.7505147	115620	2327	.5875743	121562	1802	.2548424	52725	780
			113293							
	10	+0.7618440		-2357	-0.5754181	+ 123325	+1763	-0.2495699	+ 53487	+ 762
	11	.7729376	+110936	2387	.5630856	125045	1720	.2442212	54233	746
	12	.7837925	108549	2416	.5505811	126725	1680	.2387979	54960	727
	13	.7944058	106133	2444	.5379086	128366	1641	.2333019	55671	711
	14	.8047747	103689	2471	.5250720	129965	1599	.2277348	56364	693
			101218							
	15	+0.8148965		-2498	-0.5120755	+ 131525	+1560	-0.2220984	+ 57039	+ 675
	16	+0.8247685	+ 98720	2524	.4989230	133152	1519	.2163945	57661	660

Date		MEAN EQUATOR AND EQUINOX OF 1950.0								
		X			Y			Z		
Feb.	16	+0.8247685	+ 96196	-2524	-0.4989230	+133044	+1519	-0.2163945	+ 57699	+ 660
	17	.8343881	93647	2549	.4856186	134524	1480	.2106246	58340	641
	18	.8437528	91072	2575	.4721662	135963	1439	.2047906	58965	625
	19	.8528600	88473	2599	.4585699	137362	1399	.1988941	59573	608
	20	.8617073	85850	2623	.4448337	138720	1358	.1929368	60163	590
	21	+0.8702923	+ 83203	-2647	-0.4309617	+140037	+1317	-0.1869205	+ 60736	+ 573
	22	.8786126	80531	2672	.4169580	141315	1278	.1808469	61290	554
	23	.8866657	77838	2693	.4028265	142549	1234	.1747179	61829	539
	24	.8944495	75120	2718	.3885716	143744	1195	.1685350	62348	519
	25	.9019615	72378	2742	.3741972	144896	1152	.1623002	62849	501
	26	+0.9091993	+ 69615	-2763	-0.3597076	+146005	+1109	-0.1560153	+ 63331	+ 482
	27	.9161608	66829	2786	.3451071	147072	1067	.1496822	63796	465
Mar.	28	.9228437	64020	2809	.3303999	148093	1021	.1433026	64239	443
	1	.9292457	61189	2831	.3155906	149069	976	.1368787	64663	424
	2	.9353646	58338	2851	.3006837	149998	929	.1304124	65066	403
	3	+0.9411984	+ 55467	-2871	-0.2856839	+150878	+ 880	-0.1239058	+ 65447	+ 381
	4	.9467451	52578	2889	.2705961	151709	831	.1173611	65806	359
	5	.9520029	49674	2904	.2554252	152489	780	.1107805	66144	338
	6	.9569703	46755	2919	.2401763	153217	728	.1041661	66459	315
	7	.9616458	43826	2929	.2248546	153896	679	.0975202	66750	291
	8	+0.9660284	+ 40888	-2938	-0.2094650	+154523	+ 627	-0.0908452	+ 67021	+ 271
	9	.9701172	37941	2947	.1940127	155100	577	.0841431	67270	249
	10	.9739113	34990	2951	.1785027	155628	528	.0774161	67498	228
	11	.9774103	32034	2956	.1629399	156105	477	.0706663	67702	204
12	.9806137	29074	2960	.1473294	156536	431	.0638961	67889	187	
13	+0.9835211	+ 26111	-2963	-0.1316758	+156919	+ 383	-0.0571072	+ 68055	+ 166	
14	.9861322	23145	2966	.1159839	157255	336	.0503017	68200	145	
15	.9884467	20178	2967	.1002584	157545	290	.0434817	68325	125	
16	.9904645	17210	2968	.0845039	157788	243	.0366492	68430	105	
17	.9921855	14241	2969	.0687251	157986	198	.0298062	68517	87	
18	+0.9936096	+ 11271	-2970	-0.0529265	+158139	+ 153	-0.0229545	+ 68584	+ 67	
19	.9947367	8302	2969	.0371126	158246	107	.0160961	68631	47	
20	.9955669	5335	2967	.0212880	158308	62	.0092330	68660	29	
21	.9961004	2367	2968	-.0054572	158325	+ 17	-.0023670	68670	+ 10	
22	.9963371	598	2965	+ .0103753	158298	- 27	+ .0045000	68658	- 12	
23	+0.9962773	+ 3562	-2964	+0.0262051	+158228	- 70	+0.0113658	+ 68629	- 29	
24	.9959211	6526	2964	.0420279	158114	114	.0182287	68581	48	
25	.9952685	9486	2960	.0578393	157952	162	.0250868	68513	68	
26	.9943199	12445	2959	.0736345	157746	206	.0319381	68425	88	
27	.9930754	15401	2956	.0894091	157496	250	.0387806	68316	109	
28	+0.9915353	+ 18355	-2954	+0.1051587	+157199	- 297	+0.0456122	+ 68188	- 128	
29	.9896998	21304	2949	.1208786	156854	345	.0524310	68039	149	
30	.9875694	24248	2944	.1365640	156462	392	.0592349	67868	171	
31	.9851446	27186	2938	.1522102	156020	442	.0660217	67677	191	
Apr.	1	.9824260	30116	2930	.1678122	155531	489	.0727894	67463	214
	2	+0.9794144	+ 33035	-2919	+0.1833653	+154990	- 541	+0.0795357	+ 67227	- 236
	3	+0.9761109	- 33035	-2907	+0.1988643	+154990	- 590	+0.0862584	+ 67227	- 258

SUN'S CO-ORDINATES, 1935

Date		MEAN EQUATOR AND EQUINOX OF 1950.0								
		X			Y			Z		
Apr.	1	+0.9824260	-30116	-2930	+0.1678122	+155531	-489	+0.0727894	+67463	-214
	2	.9794144	33035	2919	.1833653	154990	541	.0795357	67227	236
	3	.9761109	35942	2907	.1988643	154400	590	.0862584	66969	258
	4	.9725167	38836	2894	.2143043	153762	638	.0929553	66691	278
	5	.9686331	41713	2877	.2296805	153075	687	.0996244	66391	300
	6	+0.9644618	-44572	-2859	+0.2449880	+152340	-735	+0.1062635	+66072	-319
	7	.9600046	47412	2840	.2602220	151558	782	.1128707	65731	341
	8	.9552634	50232	2820	.2753778	150733	825	.1194438	65372	359
	9	.9502402	53030	2798	.2904511	149864	869	.1259810	64994	378
	10	.9449372	55807	2777	.3054375	148952	912	.1324804	64597	397
	11	+0.9393565	-58562	-2755	+0.3203327	+147997	-955	+0.1389401	+64184	-413
	12	.9335003	61297	2735	.3351324	147001	996	.1453585	63752	432
	13	.9273706	64007	2710	.3498325	145965	1036	.1517337	63302	450
	14	.9209699	66697	2690	.3644290	144889	1076	.1580639	62838	464
	15	.9143002	69362	2665	.3789179	143775	1114	.1643477	62354	484
	16	+0.9073640	-72004	-2642	+0.3932954	+142620	-1155	+0.1705831	+61855	-499
	17	.9001636	74622	2618	.4075574	141428	1192	.1767686	61340	515
	18	.8927014	77216	2594	.4217002	140200	1228	.1829026	60808	532
	19	.8849798	79787	2571	.4357202	138934	1266	.1889834	60260	548
	20	.8770011	82335	2548	.4496136	137631	1303	.1950094	59697	563
	21	+0.8687676	-84858	-2523	+0.4633767	+136291	-1340	+0.2009791	+59118	-579
	22	.8602818	87360	2502	.4770058	134917	1374	.2068909	58522	596
	23	.8515458	89835	2475	.4904975	133593	1414	.2127431	57910	612
	24	.8425623	92287	2452	.5038478	132052	1451	.2185341	57281	629
	25	.8333336	94715	2428	.5170530	130565	1487	.2242622	56637	644
	26	+0.8238621	-97117	-2402	+0.5301095	+129040	-1525	+0.2299259	+55975	-662
	27	.8141504	99492	2375	.5430135	127475	1565	.2355234	55296	679
	28	.8042012	101839	2347	.5557610	125872	1603	.2410530	54598	698
	29	.7940173	104157	2318	.5683482	124230	1642	.2465128	53886	712
	30	.7836016	106443	2286	.5807712	122550	1680	.2519014	53155	731
May	1	+0.7729573	-108697	-2254	+0.5930262	+120831	-1719	+0.2572169	+52408	-747
	2	.7620876	110914	2217	.6051093	119075	1756	.2624577	51645	763
	3	.7509962	113096	2182	.6170168	117283	1792	.2676222	50866	779
	4	.7396866	115240	2144	.6287451	115456	1827	.2727088	50072	794
	5	.7281626	117346	2106	.6402907	113596	1860	.2777160	49264	808
	6	+0.7164280	-119411	-2065	+0.6516503	+111702	-1894	+0.2826424	+48441	-823
	7	.7044869	121439	2028	.6628205	109780	1922	.2874865	47608	833
	8	.6923430	123426	1987	.6737985	107827	1953	.2922473	46761	847
	9	.6800004	125374	1948	.6845812	105847	1980	.2969234	45902	859
	10	.6674630	127281	1907	.6951659	103839	2008	.3015136	45032	870
	11	+0.6547349	-129150	-1869	+0.7055498	+101805	-2034	+0.3060168	+44149	-883
	12	.6418199	130978	1828	.7157303	99745	2060	.3104317	43258	891
	13	.6287221	132767	1789	.7257048	97661	2084	.3147575	42355	903
	14	.6154454	134516	1749	.7354709	95552	2109	.3189930	41441	914
	15	.6019938	136226	1710	.7450261	93420	2132	.3231371	40519	922
	16	+0.5883712	-137895	-1669	+0.7543681	+91266	-2154	+0.3271890	+39585	-934
	17	.5745817	139789	1633	.7634947	89126	2175	.3311475	38651	941

SUN'S CO-ORDINATES, 1935

49

Date		MEAN EQUATOR AND EQUINOX OF 1950.0								
		X			Y			Z		
May	17	+0.5745817	-139528	-1633	+0.7634947	+ 89091	-2175	+0.3311475	+ 38644	- 941
	18	.5606289	141120	1592	.7724038	86893	2198	.3350119	37691	953
	19	.5465169	142673	1553	.7810931	84675	2218	.3387810	36731	960
	20	.5322496	144190	1517	.7895606	82435	2240	.3424541	35760	971
	21	.5178306	145669	1479	.7978041	80174	2261	.3460301	34780	980
	22	+0.5032637	-147109	-1440	+0.8058215	+ 77891	-2283	+0.3495081	+ 33790	- 990
	23	.4885528	148511	1402	.8136106	75585	2306	.3528871	32790	1000
	24	.4737017	149873	1362	.8211691	73257	2328	.3561661	31780	1010
	25	.4587144	151194	1321	.8284948	70907	2350	.3593441	30760	1020
	26	.4435950	152472	1278	.8355855	68534	2373	.3624201	29729	1031
	27	+0.4283478	-153708	-1236	+0.8424389	+ 66140	-2394	+0.3653930	+ 28689	-1040
	28	.4129770	154900	1192	.8490529	63724	2416	.3682619	27638	1051
	29	.3974870	156045	1145	.8554253	61288	2436	.3710257	26581	1057
	30	.3818825	157144	1099	.8615541	58832	2456	.3736838	25514	1067
	31	.3661681	158193	1049	.8674373	56358	2474	.3762352	24439	1075
June	1	+0.3503488	-159195	-1002	+0.8730731	+ 53866	-2492	+0.3786791	+ 23358	-1081
	2	.3344293	160146	951	.8784597	51361	2505	.3810149	22271	1087
	3	.3184147	161048	902	.8835958	48842	2519	.3832420	21177	1094
	4	.3023099	161900	852	.8884800	46310	2532	.3853597	20078	1099
	5	.2861199	162704	804	.8931110	43768	2542	.3873675	18977	1101
	6	+0.2698495	-163458	- 754	+0.8974878	+ 41216	-2552	+0.3892652	+ 17869	-1108
	7	.2535037	164164	706	.9016094	38655	2561	.3910521	16760	1109
	8	.2370873	164822	658	.9054749	36087	2568	.3927281	15647	1113
	9	.2206051	165432	610	.9090836	33512	2575	.3942928	14531	1116
	10	.2040619	165993	561	.9124348	30931	2581	.3957459	13413	1118
	11	+0.1874626	-166509	- 516	+0.9155279	+ 28345	-2586	+0.3970872	+ 12293	-1120
	12	.1708117	166977	468	.9183624	25753	2592	.3983165	11170	1123
	13	.1541110	167399	422	.9209377	23159	2594	.3994335	10047	1123
	14	.1373741	167775	376	.9232536	20563	2596	.4004382	8922	1125
	15	.1205966	168108	333	.9253099	17963	2600	.4013304	7795	1127
	16	+0.1037858	-168395	- 287	+0.9271062	+ 15361	-2602	+0.4021099	+ 6668	-1127
	17	.0869463	168640	245	.9286423	12756	2605	.4027767	5539	1129
	18	.0700823	168841	201	.9299179	10149	2607	.4033306	4409	1130
	19	.0531982	168999	158	.9309328	7537	2612	.4037715	3277	1132
	20	.0362983	169112	113	.9316865	4923	2614	.4040992	2141	1136
	21	+0.0193871	-169182	- 70	+0.9321788	+ 2305	-2618	+0.4043133	+ 1005	-1136
	22	+ .0024689	169205	- 23	.9324093	2042	2622	.4044138	8922	1138
	23	- .0144516	169183	+ 22	.9323776	17963	2625	.4044005	7795	1141
	24	.0313699	169111	72	.9320834	15361	2627	.4042731	6668	1140
	25	.0482810	168991	120	.9315265	12756	2629	.4040317	5539	1143
	26	-0.0651801	-168822	+ 169	+0.9307067	+ 10149	-2631	+0.4036760	+ 4409	-1142
	27	.0820623	168601	221	.9296238	7537	2628	.4032061	3277	1142
	28	.0989224	168331	270	.9282781	4923	2627	.4026220	2141	1141
	29	.1157555	168009	322	.9266697	2305	2623	.4019238	1005	1139
	30	.1325564	167637	372	.9247990	2042	2618	.4011117	8922	1135
July	1	-0.1493201	-167213	+ 424	+0.9226665	+ 2305	-2612	+0.4001861	+ 1005	-1134
	2	-0.1660414	-167213	+ 472	+0.9202728	+ 23937	-2604	+0.3991471	+ 10390	-1129

SUN'S CO-ORDINATES, 1935

Date		MEAN EQUATOR AND EQUINOX OF 1950.0									
		X			Y			Z			
July	1	-0.1493201	-167213	+ 424	+0.9226665	-23937	-2612	+0.4001861	-10390	-1134	
	2	.1660414	166741	472	.9202728	26541	2604	.3991471	11519	1129	
	3	.1827155	166216	525	.9176187	29136	2595	.3979952	12644	1125	
	4	.1993371	165644	572	.9147051	31720	2584	.3967308	13764	1120	
	5	.2159015	165024	620	.9115331	34293	2573	.3953544	14879	1115	
	6	-0.2324039	-164356	+ 668	+0.9081038	-36855	-2562	+0.3938665	-15990	-1111	
	7	.2488395	163541	715	.9044183	39403	2548	.3922675	17093	1103	
	8	.2652036	162880	761	.9004780	41937	2534	.3905582	18192	1099	
	9	.2814916	162072	808	.8962843	44458	2521	.3887390	19282	1090	
	10	.2976988	161220	852	.8918385	46963	2505	.3868108	20368	1086	
	11	-0.3138208	-160324	+ 896	+0.8871422	-49453	-2490	+0.3847740	-21446	-1078	
	12	.3298532	159385	939	.8821969	51925	2472	.3826294	22516	1070	
	13	.3457917	158405	980	.8770044	54382	2457	.3803778	23581	1065	
	14	.3616322	157384	1021	.8715662	56821	2439	.3780197	24639	1058	
	15	.3773706	156323	1061	.8658841	59245	2424	.3755558	25690	1051	
	16	-0.3930029	-155220	+1103	+0.8599596	-61652	-2407	+0.3729868	-26732	-1043	
	17	.4085249	154080	1140	.8537944	64046	2394	.3703135	27772	1039	
	18	.4239329	152899	1181	.8473898	66423	2377	.3675363	28803	1031	
	19	.4392228	151677	1222	.8407475	68785	2362	.3646560	29830	1027	
	20	.4543905	150413	1264	.8338690	71133	2348	.3616730	30849	1019	
	21	-0.4694318	-149108	+1305	+0.8267557	-73466	-2333	+0.3585881	-31863	-1014	
	22	.4843426	147757	1351	.8194091	75782	2316	.3554018	32868	1005	
	23	.4991183	146363	1394	.8118309	78080	2298	.3521150	33868	1000	
	24	.5137546	144926	1437	.8040229	80359	2279	.3487282	34858	990	
	25	.5282472	143443	1483	.7959870	82619	2260	.3452424	35840	982	
	26	-0.5425915	-141915	+1528	+0.7877251	-84857	-2238	+0.3416584	-36812	-972	
	27	.5567830	140345	1570	.7792394	87074	2217	.3379772	37773	961	
	28	.5708175	138730	1615	.7705320	89265	2191	.3341999	38723	950	
	29	.5846905	137071	1659	.7616055	91430	2165	.3303276	39663	940	
	30	.5983976	135372	1699	.7524625	93569	2139	.3263613	40591	928	
	31	-0.6119348	-133630	+1742	+0.7431056	-95682	-2113	+0.3223022	-41507	-916	
Aug.	1	.6252978	131849	1781	.7335374	97765	2083	.3181515	42409	902	
	2	.6384827	130028	1821	.7237609	99819	2054	.3139106	43299	890	
	3	.6514855	128168	1860	.7137790	101843	2024	.3095807	44175	876	
	4	.6643023	126272	1896	.7035947	103837	1994	.3051632	45039	864	
	5	-0.6769295	-124339	+1933	+0.6932110	-105799	-1962	+0.3006593	-45888	-849	
	6	.6893634	122370	1969	.6826311	107729	1930	.2960705	46724	836	
	7	.7016004	120368	2002	.6718582	109627	1898	.2913981	47546	822	
	8	.7136372	118332	2036	.6608955	111493	1866	.2866435	48353	807	
	9	.7254704	116264	2068	.6497462	113324	1831	.2818082	49147	794	
	10	-0.7370968	-114167	+2097	+0.6384138	-115124	-1800	+0.2768935	-49926	-779	
	11	.7485135	112038	2129	.6269014	116889	1765	.2719009	50691	765	
	12	.7597173	109883	2155	.6152125	118623	1734	.2668318	51442	751	
	13	.7707056	107698	2185	.6033502	120325	1702	.2616876	52182	740	
	14	.7814754	105487	2211	.5913177	121995	1670	.2564694	52907	725	
	15	-0.7920241	-103247	+2240	+0.5791182	-123635	-1640	+0.2511787	-53619	-712	
	16	-0.8023488	-101247	+2270	+0.5667547	-125365	-1611	+0.2458168	-54369	-699	

SUN'S CO-ORDINATES, 1935

51

Date	MEAN EQUATOR AND EQUINOX OF 1950.0									
	X			Y			Z			
Aug. 16	-0.8023488		+2270	+0.5667547	-125246	-1611	+0.2458168		54318	-699
17	.8124465	-100977	2298	.5542301	126825	1579	.2403850		55005	687
18	.8223144	98679	2328	.5415476	128373	1548	.2348845		55679	674
19	.8319495	96351	2359	.5287103	129888	1515	.2293166		56337	658
20	.8413487	93992	2390	.5157215	131372	1484	.2236829		56982	645
21	-0.8505089	91602	+2421	+0.5025843	-132821	-1449	+0.2179847		57613	-631
22	.8594270	-89181	2451	.4893022	134233	1412	.2122234		58226	613
23	.8681000	86730	2481	.4758789	135608	1375	.2064008		58824	598
24	.8765249	84249	2512	.4623181	136947	1339	.2005184		59405	581
25	.8846986	81737	2539	.4486234	138247	1300	.1945779		59968	563
26	-0.8926184	79198	+2566	+0.4347987	-139505	-1258	+0.1885811		60513	-545
27	.9002816	-76632	2593	.4208482	140721	1216	.1825298		61042	529
28	.9076855	74039	2617	.4067761	141898	1177	.1764256		61550	508
29	.9148727	71422	2641	.3925863	143032	1134	.1702706		62042	492
30	.9217058	68781	2663	.3782831	144123	1091	.1640664		62513	471
31	-0.9283176	66118	+2686	+0.3638708	-145171	-1048	+0.1578151		62966	-453
Sept. 1	.9346608	-63432	2705	.3493537	146173	1002	.1515185		63400	434
2	.9407335	60727	2723	.3347364	147134	961	.1451785		63816	416
3	.9465339	58004	2742	.3200230	148049	915	.1387969		64210	394
4	.9520601	55262	2757	.3052181	148920	871	.1323759		64586	376
5	-0.9573106	52505	+2771	+0.2903261	-149747	-827	+0.1259173		64944	-358
6	.9622840	-49734	2786	.2753514	150528	781	.1194229		65282	338
7	.9669788	46948	2797	.2602986	151265	737	.1128947		65601	319
8	.9713939	44151	2809	.2451721	151959	694	.1063346		65902	301
9	.9755281	41342	2818	.2299762	152610	651	.0997444		66184	282
10	-0.9793805	38524	+2828	+0.2147152	-153220	-610	+0.0931260		66449	-265
11	.9829501	-35696	2836	.1993932	153787	567	.0864811		66695	246
12	.9862361	32860	2846	.1840145	154313	526	.0798116		66926	231
13	.9892375	30014	2855	.1685832	154800	487	.0731190		67138	212
14	.9919534	27159	2866	.1531032	155246	446	.0664052		67333	195
15	-0.9943827	24293	+2876	+0.1375786	-155653	-407	+0.0596719		67512	-179
16	.9965244	-21417	2887	.1220133	156016	363	.0529207		67671	159
17	.9983774	18530	2899	.1064117	156339	323	.0461536		67812	141
18	.9999405	15631	2908	.0907778	156617	278	.0393724		67934	122
19	1.0012128	12723	2920	.0751161	156852	235	.0325790		68036	102
20	-1.0021931	9803	+2928	+0.0594309	-157040	-188	+0.0257754		68119	-83
21	1.0028806	-6875	2936	.0437269	157182	142	.0189635		68181	62
22	1.0032745	3939	2942	.0280087	157277	95	.0121454		68221	40
23	1.0033742	-997	2948	.0122810	157323	46	.0053233		68241	-20
24	1.0031791	+1951	2952	.0034513	157321	2	.0015008		68240	+1
25	-1.0026888	4903	+2955	-0.0191834	-157273	-48	-0.0083248		68217	+23
26	1.0019030	+7858	2955	.0349107	157174	99	.0151465		68174	43
27	1.0008217	10813	2956	.0506281	157027	147	.0219639		68108	66
28	.9999448	13769	2954	.0663308	156832	195	.0287747		68022	86
29	.9977725	16723	2950	.0820140	156585	247	.0355769		67914	108
30	-0.9958052	19673	+2947	-0.0976725	-156291	-294	-0.0423683		67784	+130
Oct. 1	-0.9935432	+22620	+2941	-0.1133016	+2941	+343	-0.0491467		+67784	+149

SUN'S CO-ORDINATES, 1935

Date		MEAN EQUATOR AND EQUINOX OF 1950.0								
		X			Y			Z		
Oct.	1	-0.9935432	+ 25561	+2941	-0.1133016	-155948	+ 343	-0.0491467	- 67635	+ 149
	2	.9909871	28494	2933	.1288964	155556	392	.0559102	67454	171
	3	.9881377	31419	2925	.1444520	155117	439	.0626566	67272	192
	4	.9849958	34333	2914	.1599637	154629	488	.0693838	67060	212
	5	.9815625	37236	2903	.1754266	154095	534	.0760898	66827	233
	6	-0.9778389	+ 40127	+2891	-0.1908361	-153514	+ 581	-0.0827725	- 66576	+ 251
	7	.9738262	43005	2878	.2061875	152891	623	.0894301	66305	271
	8	.9695257	45867	2862	.2214766	152221	670	.0960606	66017	288
	9	.9649390	48717	2850	.2366987	151510	711	.1026623	65709	308
	10	.9600673	51554	2837	.2518497	150757	753	.1092332	65383	326
	11	-0.9549119	+ 54375	+2821	-0.2669254	-149961	+ 796	-0.1157715	- 65041	+ 342
	12	.9494744	57184	2809	.2819215	149126	835	.1222756	64681	360
	13	.9437560	59979	2795	.2968341	148249	877	.1287437	64301	380
	14	.9377581	62763	2784	.3116590	147331	918	.1351738	63904	397
	15	.9314818	65535	2772	.3263921	146370	961	.1415642	63489	415
	16	-0.9249283	+ 68293	+2758	-0.3410291	-145366	+1004	-0.1479131	- 63054	+ 435
	17	.9180990	71037	2744	.3555657	144318	1048	.1542185	62601	453
	18	.9109953	73765	2728	.3699975	143226	1092	.1604786	62127	474
	19	.9036188	76478	2713	.3843201	142088	1138	.1666913	61633	494
	20	.8959710	79172	2694	.3985289	140905	1183	.1728546	61120	513
	21	-0.8880538	+ 81847	+2675	-0.4126194	-139677	+1228	-0.1789666	- 60586	+ 534
	22	.8798691	84502	2655	.4265871	138404	1273	.1850252	60033	553
	23	.8714189	87134	2632	.4404275	137086	1318	.1910285	59461	572
	24	.8627055	89743	2609	.4541361	135723	1363	.1969746	58868	593
	25	.8537312	92326	2583	.4677084	134313	1410	.2028614	58255	613
	26	-0.8444986	+ 94885	+2559	-0.4811397	-132861	+1452	-0.2086869	- 57624	+ 631
	27	.8350101	97415	2530	.4944258	131366	1495	.2144493	56974	650
	28	.8252686	99917	2502	.5075624	129825	1541	.2201467	56305	669
	29	.8152769	102388	2471	.5205449	128242	1583	.2257772	55616	689
	30	.8050381	104828	2440	.5333691	126618	1624	.2313388	54912	704
	31	-0.7945553	+107234	+2406	-0.5460309	-124952	+1666	-0.2368300	- 54188	+ 724
Nov.	1	.7838319	109606	2372	.5585261	123247	1705	.2422488	53448	740
	2	.7728713	111943	2337	.5708508	121504	1743	.2475936	52691	757
	3	.7616770	114244	2301	.5830012	119721	1783	.2528627	51919	772
	4	.7502526	116508	2264	.5949733	117904	1817	.2580546	51132	787
	5	-0.7386018	+118736	+2228	-0.6067637	-116053	+1851	-0.2631678	- 50330	+ 802
	6	.7267282	120929	2193	.6183690	114167	1886	.2682008	49514	816
	7	.7146353	123084	2155	.6297857	112250	1917	.2731522	48683	831
	8	.7023269	125203	2119	.6410107	110301	1949	.2780205	47840	843
	9	.6898066	127288	2085	.6520408	108321	1980	.2828045	46984	856
	10	-0.6770778	+129336	+2048	-0.6628729	-106311	+2010	-0.2875029	- 46113	+ 871
	11	.6641442	131351	2015	.6735040	104269	2042	.2921142	45228	885
	12	.6510091	133332	1981	.6839309	102195	2074	.2966370	44330	898
	13	.6376759	135276	1944	.6941504	100091	2104	.3010700	43418	912
	14	.6241483	137185	1909	.7041595	97954	2137	.3054118	42491	927
	15	-0.6104298	+139056	+1871	-0.7139549	-95785	+2169	-0.3096609	- 41551	+ 940
	16	.5965242	+1834		.7235334		+2201	.3138160		+ 955

53

Date		MEAN EQUATOR									
		X									
Nov.	16	-0.5965242	+140890	+1834	-0.7235334	-93584	+2201	-0.3138160	-40596	+955	
	17	.5824352	142684	1794	.7328918	91350	2234	.3178756	39626	970	
	18	.5681668	144437	1753	.7420268	89084	2266	.3218382	38642	984	
	19	.5537231	146150	1713	.7509352	86788	2296	.3257024	37645	997	
	20	.5391081	147817	1667	.7596140	84460	2328	.3294669	36634	1011	
	21	-0.5243264	+149441	+1624	-0.7680600	-82102	+2358	-0.3331303	-35610	+1024	
	22	.5093823	151021	1580	.7762702	79716	2386	.3366913	34574	1036	
	23	.4942802	152554	1533	.7842418	77301	2415	.3401487	33525	1049	
	24	.4790248	154038	1484	.7919719	74857	2444	.3435012	32464	1061	
	25	.4636210	155476	1438	.7994576	72388	2469	.3467476	31390	1074	
	26	-0.4480734	+156862	+1386	-0.8066964	-69891	+2497	-0.3498866	-30308	+1082	
	27	.4323872	158199	1337	.8136855	67371	2520	.3529174	29213	1095	
	28	.4165673	159484	1285	.8204226	64827	2544	.3558387	28110	1103	
	29	.4006189	160715	1231	.8269053	62263	2564	.3586497	26997	1113	
	30	.3845474	161895	1180	.8331316	59678	2585	.3613494	25877	1120	
	Dec.	1	-0.3683579	+163021	+1126	-0.8390994	-57075	+2603	-0.3639371	-24748	+1129
		2	.3520558	164094	1073	.8448069	54456	2619	.3664119	23614	1134
		3	.3356464	165115	1021	.8502525	51823	2633	.3687733	22473	1141
		4	.3191349	166085	970	.8554348	49175	2648	.3710206	21326	1147
		5	.3025264	167003	918	.8603523	46514	2661	.3731532	20173	1153
6		-0.2858261	+167871	+868	-0.8650037	-43842	+2672	-0.3751705	-19017	+1156	
7		.2690390	168688	817	.8693879	41160	2682	.3770722	17855	1162	
8		.2521702	169457	769	.8735039	38465	2695	.3788577	16688	1167	
9		.2352245	170178	721	.8773504	35761	2704	.3805265	15516	1172	
10		.2182067	170849	671	.8809265	33046	2715	.3820781	14338	1178	
	11	-0.2011218	+171472	+623	-0.8842311	-30320	+2726	-0.3835119	-13158	+1180	
	12	.1839746	172046	574	.8872631	27583	2737	.3848277	11970	1188	
	13	.1667700	172571	525	.8900214	24836	2747	.3860247	10778	1192	
	14	.1495129	173044	473	.8925050	22078	2758	.3871025	9581	1197	
	15	.1322085	173466	422	.8947128	19309	2769	.3880606	8379	1202	
	16	-0.1148619	+173837	+371	-0.8966437	-16532	+2777	-0.3888985	-7174	+1205	
	17	.0974782	174153	316	.8982969	13745	2787	.3896159	5964	1210	
	18	.0800629	174417	264	.8996714	10952	2793	.3902123	4751	1213	
	19	.0626212	174626	209	.9007666	8152	2800	.3906874	3534	1217	
	20	.0451586	174780	154	.9015818	5346	2806	.3910408	2317	1217	
	21	-0.0276806	+174879	+99	-0.9021164	-2535	+2811	-0.3912725	-1096	+1221	
	22	-.0101927	174922	+43	.9023699	2815	2815	.3913821	126	1222	
	23	+0.072995	174908	-14	.9023419	3097	2817	.3913695	1350	1224	
	24	.0247903	174836	72	.9020322	5917	2820	.3912345	2574	1224	
	25	.0422739	174707	129	.9014405	8737	2820	.3909771	3796	1222	
	26	+0.0597446	+174520	-187	-0.9005668	-11553	+2816	-0.3905975	-5019	+1223	
	27	.0771966	174273	247	.8994115	14367	2814	.3900956	6238	1219	
	28	.0946239	173967	306	.8979748	11714	2807	.3894718	7456	1218	
	29	.1120206	173606	361	.8962574	19975	2801	.3887262	8669	1213	
	30	.1293812	173189	417	.8942599	22766	2791	.3878593	9878	1209	
	31	+0.1467001	+172714	-475	-0.8919833	-25546	+2780	-0.3868715	-11084	+1206	
	32	+0.1639715		-528	-0.8894287		+2769	-0.3857631		+1198	

Date	Horizontal Parallax	Aber- ration	Mean Longi- tude
Jan. 1	8.95	20.82	279.7194
11	8.95	20.81	289.5759
21	8.94	20.80	299.4324
31	8.93	20.78	309.2888
Feb. 10	8.92	20.74	319.1453
20	8.90	20.70	329.0018
Mar. 2	8.88	20.65	338.8583
12	8.86	20.60	348.7147
22	8.83	20.54	358.5712
Apr. 1	8.81	20.48	8.4277
11	8.78	20.43	18.2842
21	8.76	20.37	28.1406
May 1	8.73	20.32	37.9971
11	8.71	20.27	47.8536
21	8.69	20.23	57.7101
31	8.68	20.19	67.5665
June 10	8.67	20.16	77.4230
20	8.66	20.14	87.2795
30	8.66	20.13	97.1359
July 10	8.66	20.13	106.9924
20	8.66	20.14	116.8489
30	8.67	20.16	126.7054
Aug. 9	8.68	20.19	136.5618
19	8.70	20.23	146.4183
29	8.71	20.27	156.2748
Sept. 8	8.73	20.32	166.1313
18	8.76	20.37	175.9877
28	8.78	20.43	185.8442
Oct. 8	8.81	20.49	195.7007
18	8.83	20.55	205.5572
28	8.86	20.60	215.4136
Nov. 7	8.88	20.66	225.2701
17	8.90	20.71	235.1266
27	8.92	20.75	244.9830
Dec. 7	8.93	20.78	254.8395
17	8.94	20.80	264.6960
27	8.95	20.82	274.5525
37	8.95	20.82	284.4089

Mean Elements of Sun

Epoch	...	1935 Jan. 1 ^d 0 ^h
Mean longitude	= L	279° 43' 09".9
Mean anomaly	= g	357 53 48.6
Mean longitude of perigee	= π	281 49 21.3
Log semi-major axis	= $\log a$	0.0000001
Eccentricity	= e	0.0167364

PRECESSIONAL CONSTANTS

Mean obliquity = ϵ $23^{\circ} 26' 51''.86$
 $= 23^{\circ} 44' 774$

	Natural No.	Logarithm
$\sin \epsilon$...	0.3979 1244	9.599 7875
$\cos \epsilon$...	0.9174 2340	9.962 5698
$\tan \epsilon$...	0.4337 2825	9.637 2177
$\cot \epsilon$...	2.3055 911	0.362 7823
$\sec \epsilon$...	1.0900 093	0.037 4302
$\operatorname{cosec} \epsilon$...	2.5131 157	0.400 2125
General precession = p	50".2642	$= 0^{\circ}.0139623$

Precession in R.A. = m	3".07299
Precession in Dec. = n	18.33626
	$= 20''.0439$

$\log n^s$ 0.125890 $\log n''$ 1.301981

Ascending node of moving
 ecliptic on fixed ecliptic = Π $174^{\circ} 16'.22$
 $= 174^{\circ}.270$

Speed of rotation of ecliptic = π $0^{\circ}.4708$
 $= 0^{\circ}.0001308$
 $\log \pi^s$ 9.6729 $\log \pi^{\circ}$ 6.1166

For reduction from
 1935.0 to 1950.0 1950.0 to 1935.0

ζ_0 ...	5' 45".72	-5' 45".74
	$= 0^m 23^s.048$	$-0^m 23^s.049$
z ...	5' 45".74	-5' 45".72
	$= 0^m 23^s.049$	$-0^m 23^s.048$
$\sin \theta$...	0.00145758	-0.00145758
$\log \sin \theta$...	7.163633	7.163633 n
$\tan \frac{1}{2}\theta$...	0.00072879	-0.00072879
$\log \tan \frac{1}{2}\theta$	6.862603	6.862603 n
M^s ...	46 ^s .097	-46 ^s .097
N^s ...	20 ^s .043	-20 ^s .043
N'' ...	300".65	-300".65
$\log N^s$...	1.30197	1.30197 n
$\log N''$...	2.47806	2.47806 n
a ...	12' 33".99	-12' 33".99
	$= 0^{\circ}.20944$	$-0^{\circ}.20944$
b ...	7".06	-7".06
	$= 0^{\circ}.00196$	$-0^{\circ}.00196$
c ...	5° 45'.9	5° 33'.4
	$= 5^{\circ}.766$	5° 55.6

$$\begin{aligned}
 \alpha &= \alpha_0 + M + N \sin \bar{\alpha} \tan \delta \\
 \delta &= \delta_0 + N \cos \bar{\alpha} \\
 \lambda &= \lambda_0 + a - b \cos (\lambda_0 + c) \tan \beta_0 \\
 \beta &= \beta_0 + b \sin (\lambda_0 + c) \\
 \bar{\alpha} &= \bar{\alpha}_0 + a - b \sin (\bar{\alpha}_0 + c) \cot i_0 \\
 i &= i_0 + b \cos (\bar{\alpha}_0 + c) \\
 \omega &= \omega_0 + b \sin (\bar{\alpha}_0 + c) \operatorname{cosec} i_0
 \end{aligned}$$

MEAN EQUATOR, ORBIT, AND MEAN LONGITUDE

Date	Mean Equator			Orbit		Mean Longitude (	Mean Solar Days	Motion in Mean Longitude
	i	Δ	g'	Γ'	g			
Jan. 8	22°675	118°767	+3°383	319°242	301°876	323°139	0·1	1°318
18	22°687	118°223	3°400	320°356	301°347	94°903	0·2	2°635
28	22°699	117°677	3°417	321°470	300°817	226°667	0·3	3°953
Feb. 7	22°711	117°132	3°435	322°584	300°288	358°431	0·4	5°270
17	22°724	116°588	3°452	323°698	299°758	130°195	0·5	6°588
27	22°737	116°043	+3°468	324°812	299°229	261°959	0·6	7°906
Mar. 9	22°750	115°499	3°483	325°926	298°699	33°723	0·7	9°223
19	22°763	114°956	3°498	327°040	298°170	165°487	0·8	10°541
29	22°775	114°412	3°515	328°154	297°640	297°251	0·9	11°859
Apr. 8	22°788	113°869	3°530	329°269	297°111	69°015	1·0	13°176
18	22°801	113°326	+3°543	330°383	296°581	200°779	2·0	26°353
28	22°814	112°783	3°558	331°497	296°051	332°543	3·0	39°529
May 8	22°827	112°241	3°572	332°611	295°522	104°307	4·0	52°705
18	22°840	111°699	3°587	333°725	294°992	236°071	5·0	65°882
28	22°853	111°157	3°600	334°839	294°463	7°835	6·0	79°058
June 7	22°866	110°616	+3°612	335°953	293°933	139°599	7·0	92°235
17	22°880	110°075	3°625	337°067	293°404	271°363	8·0	105°411
27	22°893	109°534	3°637	338°181	292°874	43°127	9·0	118°587
July 7	22°906	108°994	3°650	339°295	292°345	174°891	10·0	131°764
17	22°920	108°454	3°662	340°409	291°815	306°655	Hours	
27	22°933	107°914	+3°673	341°523	291°286	78°419		0°549
Aug. 6	22°947	107°375	3°684	342°637	290°756	210°183		1°098
16	22°961	106°836	3°694	343°751	290°227	341°946		1°647
26	22°974	106°297	3°705	344°865	289°697	113°710	4	2°196
Sept. 5	22°988	105°758	3°715	345°979	289°167	245°474	5	2°745
15	23°001	105°220	+3°724	347°093	288°638	17°238	6	3°294
25	23°015	104°682	3°734	348°207	288°108	149°002	7	3°843
Oct. 5	23°029	104°144	3°743	349°321	287°579	280°766	8	4°392
15	23°043	103°607	3°752	350°435	287°049	52°530	9	4°941
25	23°056	103°070	3°760	351°549	286°520	184°294	10	5°490
Nov. 4	23°070	102°533	+3°768	352°663	285°990	316°058	11	6°039
14	23°084	101°996	3°775	353°777	285°461	87°822	12	6°588
24	23°098	101°460	3°783	354°891	284°931	219°586	13	7°137
Dec. 4	23°112	100°924	3°790	356°005	284°402	351°350	14	7°686
14	23°125	100°389	3°797	357°120	283°872	123°114	15	8°235
24	23°139	99°854	+3°803	358°234	283°343	254°878	16	8°784
34	23°153	99°319	+3°809	359°348	282°813	26°642	17	9°333
							18	9°882
							19	10°431
							20	10°980
							21	11°529
							22	12°078
							23	12°627

Daily motion of $\Gamma' + 0^\circ.11140$ Daily motion of $g - 0^\circ.05295$

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
Jan. 1-0	223 50 49.7	-5 07 53.5	15 39.21	57 27.04	25.3	U 1 08 17.9
1-5	230 34 59.7	4 57 46.3	15 46.88	57 55.20	26.3	L 1 20 45.6
2-0	237 25 55.6	4 43 15.8	15 54.58	58 23.44	27.3	U 2 09 14.7
2-5	244 23 33.5	4 24 21.8	16 02.13	58 51.17	28.3	L 2 21 44.9
3-0	251 27 39.6	4 01 09.6	16 09.36	59 17.71	29.3	U 3 10 16.1
3-5	258 37 50.1	-3 33 50.7	16 16.09	59 42.39	30.8	L 3 22 47.9
4-0	265 53 31.1	3 02 43.9	16 22.12	60 04.53	31.8	U 4 11 20.0
4-5	273 13 59.4	2 28 14.8	16 27.29	60 23.51	32.1	L 4 23 52.0
5-0	280 38 23.6	1 50 56.5	16 31.45	60 38.78	31.5	...
5-5	288 05 45.6	1 11 28.3	16 34.48	60 49.90	30.8	U 5 12 23.5
6-0	295 35 03.0	-0 30 34.6	16 36.31	60 56.60	29.8	L 6 00 54.3
6-5	303 05 11.1	+0 10 56.9	16 36.89	60 58.74	28.8	U 6 13 24.1
7-0	310 35 05.4	0 52 16.9	16 36.25	60 56.38	27.8	L 7 01 52.9
7-5	318 03 44.2	1 32 36.7	16 34.43	60 49.71	26.9	U 7 14 20.7
8-0	325 30 10.3	2 11 10.5	16 31.54	60 39.10	26.0	L 8 02 47.6
8-5	332 53 33.3	+2 47 16.4	16 27.70	60 25.00	25.3	U 8 15 13.6
9-0	340 13 09.8	3 20 18.4	16 23.06	60 07.97	24.7	L 9 03 38.9
9-5	347 28 25.0	3 49 46.7	16 17.77	59 48.57	24.4	U 9 16 03.6
10-0	354 38 52.6	4 15 17.9	16 12.01	59 27.41	24.2	L 10 04 28.0
10-5	1 44 14.5	4 36 35.2	16 05.92	59 05.06	24.1	U 10 16 52.2
11-0	8 44 20.1	+4 53 28.1	15 59.65	58 42.05	24.2	L 11 05 16.3
11-5	15 39 05.8	5 05 51.3	15 53.33	58 18.85	24.4	U 11 17 40.5
12-0	22 28 33.6	5 13 44.4	15 47.06	57 55.85	24.7	L 12 06 04.9
12-5	29 12 50.7	5 17 11.2	15 40.94	57 33.39	25.1	U 12 18 29.6
13-0	35 52 07.6	5 16 18.7	15 35.04	57 11.72	25.5	L 13 06 54.7
13-5	42 26 38.0	+5 11 16.9	15 29.40	56 51.04	25.9	U 13 19 20.2
14-0	48 56 37.5	5 02 17.9	15 24.07	56 31.48	26.2	L 14 07 46.1
14-5	55 22 22.7	4 49 35.9	15 19.07	56 13.11	26.5	U 14 20 12.3
15-0	61 44 10.9	4 33 26.6	15 14.41	55 56.00	26.7	L 15 08 38.8
15-5	68 02 19.4	4 14 06.8	15 10.08	55 40.12	26.7	U 15 21 05.5
16-0	74 17 05.4	+3 51 54.8	15 06.10	55 25.48	26.5	L 16 09 32.2
16-5	80 28 45.5	3 27 09.4	15 02.44	55 12.06	26.2	U 16 21 58.7
17-0	86 37 35.7	3 00 10.3	14 59.10	54 59.80	25.7	L 17 10 24.9
17-5	92 43 51.3	2 31 18.0	14 56.07	54 48.68	25.2	U 17 22 50.6
18-0	98 47 47.0	2 00 53.2	14 53.34	54 38.66	24.4	L 18 11 15.8
18-5	104 49 37.3	+1 29 17.0	14 50.90	54 29.73	23.8	U 18 23 40.2
19-0	110 49 36.0	0 56 50.3	14 48.76	54 21.87	23.0	...
19-5	116 47 57.3	+0 23 54.5	14 46.92	54 15.10	22.4	L 19 12 04.0
20-0	122 44 55.2	-0 09 09.7	14 45.38	54 09.45	21.7	U 20 00 27.0
20-5	128 40 44.4	0 42 01.6	14 44.16	54 04.97	21.1	L 20 12 49.4
21-0	134 35 40.2	-1 14 21.4	14 43.27	54 01.72	21.1	U 21 01 11.1
21-5	140 29 58.9	1 45 49.9	14 42.75	53 59.79	20.6	L 21 13 32.2
22-0	146 23 57.8	2 16 08.3	14 42.61	53 59.28	20.3	U 22 01 52.8
22-5	152 17 55.9	2 44 59.0	14 42.89	54 00.29	20.0	L 22 14 13.1
23-0	158 12 13.6	3 12 05.1	14 43.61	54 02.93	19.9	U 23 02 33.1
23-5	164 07 12.8	-3 37 10.7	14 44.81	54 07.34	19.8	L 23 14 53.0
24-0	170 03 17.2	-4 00 00.3	14 46.52	54 13.63	19.8	U 24 03 12.8

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
						^{12h} ^{d h m} ^{+ m}
Jan. 24.0	170° 03' 17.2	-4° 00' 00.3	14 46.52	54 13.63 + 8.28	18.8	U 24 03 12.8 L 24 15 32.7
24.5	176 00 52.3	4 20 19.7	14 48.78	54 21.91		19.9
25.0	182 00 25.2	4 37 55.1	14 51.60	54 32.28	10.37	19.8
25.5	188 02 24.4	4 52 33.4	14 55.02	54 44.82	12.54	20.5
26.0	194 07 19.7	5 04 02.4	14 59.04	54 59.58	14.76	21.0
					17.02	21.7
26.5	200 15 42.1	-5 12 10.2	15 03.68	55 16.60		L 26 16 56.1
27.0	206 28 02.6	5 16 45.9	15 08.92	55 35.85	+19.25	21.8
27.5	212 44 52.6	5 17 39.3	15 14.75	55 57.26	21.41	L 27 17 42.2
28.0	219 06 42.5	5 14 41.4	15 21.15	56 20.73	23.47	22.8
28.5	225 34 01.3	5 07 44.5	15 28.05	56 46.06	25.33	L 28 18 32.4
					26.91	26.9
29.0	232 07 14.9	-4 56 42.8	15 35.38	57 12.97	+28.17	23.8
29.5	238 46 46.0	4 41 33.1	15 43.05	57 41.14	28.97	L 29 19 27.4
30.0	245 32 52.2	4 22 15.2	15 50.95	58 10.11	29.28	24.8
30.5	252 25 44.8	3 58 53.3	15 58.93	58 39.39	28.97	L 30 20 26.8
31.0	259 25 27.7	3 31 36.1	16 06.82	59 08.36	27.98	25.8
						31.0
31.5	266 31 55.8	-3 00 38.2	16 14.44	59 36.34	+26.27	L 31 21 29.2
Feb. 1.0	273 44 54.0	2 26 20.7	16 21.60	60 02.61	23.82	26.8
1.5	281 03 56.8	1 49 11.2	16 28.09	60 26.43	20.63	L 1 22 32.1
2.0	288 28 27.5	1 09 44.6	16 33.71	60 47.06	16.76	27.8
2.5	295 57 38.8	-0 28 41.9	16 38.27	61 03.82	12.32	L 2 23 33.0
						29.3
3.0	303 30 33.2	+0 13 10.5	16 41.63	61 16.14		28.8
3.5	311 06 05.0	0 55 02.4	16 43.66	61 23.59	+7.45	...
4.0	318 43 02.4	1 36 01.9	16 44.29	61 25.91	+2.32	U 3 12 02.3
4.5	326 20 09.8	2 15 18.1	16 43.51	61 23.05	-2.86	L 4 00 30.8
5.0	333 56 11.2	2 52 03.0	16 41.36	61 15.14	7.91	U 4 12 58.4
					12.62	L 5 01 25.3
5.5	341 29 53.1	+3 25 33.9	16 37.92	61 02.52	-16.83	U 5 13 51.6
6.0	349 00 07.3	3 55 14.9	16 33.33	60 45.69	20.44	L 6 02 17.3
6.5	356 25 53.5	4 20 38.1	16 27.76	60 25.25	23.37	U 6 14 42.7
7.0	3 46 21.1	4 41 24.1	16 21.40	60 01.88	25.56	L 7 03 08.0
7.5	11 00 50.6	4 57 21.5	16 14.44	59 36.32	27.04	U 7 15 33.1
						25.2
8.0	18 08 53.3	+5 08 26.5	16 07.07	59 09.28	-27.83	L 8 03 58.3
8.5	25 10 12.1	5 14 41.9	15 59.48	58 41.45	28.02	U 8 16 23.7
9.0	32 04 40.4	5 16 15.7	15 51.85	58 13.43	27.66	L 9 04 49.3
9.5	38 52 20.7	5 13 20.3	15 44.32	57 45.77	26.84	U 9 17 15.2
10.0	45 33 23.7	5 06 11.1	15 37.00	57 18.93	25.66	L 10 05 41.4
						26.5
10.5	52 08 06.7	+4 55 05.7	15 30.01	56 53.27	-24.19	U 10 18 07.9
11.0	58 36 52.3	4 40 23.1	15 23.42	56 29.08	22.51	L 11 06 34.6
11.5	65 00 06.5	4 22 22.9	15 17.29	56 06.57	20.69	U 11 19 01.4
12.0	71 18 18.4	4 01 25.4	15 11.65	55 45.88	18.78	L 12 07 28.2
12.5	77 31 58.3	3 37 50.7	15 06.54	55 27.10	16.84	U 12 19 54.8
						26.3
13.0	83 41 37.2	+3 11 59.1	15 01.95	55 10.26	-14.91	L 13 08 21.1
13.5	89 47 45.8	2 44 10.7	14 57.89	54 55.35	13.01	U 13 20 47.0
14.0	95 50 54.3	2 14 45.5	14 54.34	54 42.34	11.17	L 14 09 12.3
14.5	101 51 31.4	1 44 03.3	14 51.30	54 31.17	9.41	U 14 21 37.0
15.0	107 50 04.6	1 12 23.9	14 48.73	54 21.76	7.74	L 15 10 01.1
						23.4
15.5	113 46 59.5	+0 40 06.9	14 46.62	54 14.02	-6.15	U 15 22 24.5
16.0	119 42 39.8	+0 07 31.9	14 44.95	54 07.87		L 16 10 47.2
						22.7

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
						^{12h} L ^d ^h ^m ⁺ U ^d ^h ^m ⁺
Feb. 16.0	119° 42' 39.8	+0° 07' 31.9	14 44.95	54 07.87	12.3	L 16 10 47.2
16.5	125 37 27.3	-0 25 01.5	14 43.68	54 03.22	4.65	U 16 23 09.2
17.0	131 31 42.2	0 57 13.9	14 42.81	54 00.00	3.22	L 17 11 30.7
17.5	137 25 42.7	1 28 46.2	14 42.30	53 58.14	1.86	U 17 23 51.6
18.0	143 19 45.7	1 59 19.6	14 42.15	53 57.58	0.56	...
18.5	149 14 06.9	-2 28 35.5	14 42.35	53 58.31	0.73	L 18 12 12.2
19.0	155 09 01.0	2 56 16.2	14 42.89	54 00.30	+1.99	U 19 00 32.4
19.5	161 04 41.9	3 22 04.4	14 43.77	54 03.55	3.25	L 19 12 52.4
20.0	167 01 23.2	3 45 43.7	14 45.01	54 08.09	4.54	U 20 01 12.3
20.5	172 59 18.6	4 06 58.8	14 46.61	54 13.95	5.86	L 20 13 32.3
21.0	178 58 42.1	-4 25 35.2	14 48.58	54 21.18	7.23	U 21 01 52.3
21.5	184 59 48.3	4 41 19.5	14 50.94	54 29.84	+8.66	L 21 14 12.6
22.0	191 02 52.6	4 53 59.9	14 53.71	54 40.00	10.16	U 22 02 33.3
22.5	197 08 11.8	5 03 25.4	14 56.90	54 51.73	11.73	L 22 14 54.5
23.0	203 16 03.9	5 09 26.5	15 00.54	55 05.10	13.37	U 23 03 16.3
23.5	209 26 48.0	-5 11 55.1	15 04.64	55 20.15	15.05	L 23 15 38.8
24.0	215 40 45.2	5 10 44.6	15 09.21	55 36.92	+16.77	U 24 04 02.2
24.5	221 58 17.2	5 05 49.8	15 14.25	55 55.42	18.50	L 24 16 26.5
25.0	228 19 46.9	4 57 07.5	15 19.76	56 15.63	20.21	U 25 04 51.9
25.5	234 45 37.9	4 44 36.3	15 25.70	56 37.46	21.83	L 25 17 18.3
26.0	241 16 13.6	-4 28 16.8	15 32.06	57 00.80	23.34	U 26 05 45.7
26.5	247 51 56.7	4 08 12.6	15 38.78	57 25.44	+24.64	L 26 18 14.0
27.0	254 33 08.1	3 44 30.2	15 45.78	57 51.14	25.70	U 27 06 43.2
27.5	261 20 06.2	3 17 19.5	15 52.97	58 17.54	26.40	L 27 19 13.0
28.0	268 13 05.1	2 46 54.8	16 00.24	58 44.23	26.69	U 28 07 43.2
28.5	275 12 13.6	-2 13 34.7	16 07.46	59 10.71	26.48	L 28 20 13.5
Mar. 1.0	282 17 33.7	1 37 43.4	16 14.45	59 36.39	+25.68	U 1 08 43.7
1.5	289 28 58.9	0 59 50.0	16 21.06	60 00.63	24.24	L 1 21 13.5
2.0	296 46 13.6	-0 20 29.3	16 27.09	60 22.76	22.13	U 2 09 42.9
2.5	304 08 50.8	+0 19 38.9	16 32.35	60 42.09	19.33	L 2 22 11.6
3.0	311 36 12.9	+0 59 50.3	16 36.68	60 57.96	15.87	U 3 10 39.8
3.5	319 07 31.0	1 39 18.0	16 39.90	61 09.79	+11.83	L 3 23 07.3
4.0	326 41 45.6	2 17 13.4	16 41.89	61 17.09	7.30	U 4 11 34.3
4.5	334 17 48.6	2 52 49.0	16 42.56	61 19.54	+2.45	...
5.0	341 54 24.9	3 25 20.0	16 41.86	61 16.98	2.56	L 5 00 00.8
5.5	349 30 16.4	+3 54 07.1	16 39.81	61 09.44	7.54	U 5 12 27.0
6.0	357 04 04.3	4 18 37.6	16 36.46	60 57.15	-12.29	L 6 00 53.0
6.5	4 34 33.4	4 38 27.2	16 31.92	60 40.51	16.64	U 6 13 19.0
7.0	12 00 35.0	4 53 20.5	16 26.35	60 20.07	20.44	L 7 01 45.0
7.5	19 21 09.5	5 03 10.8	16 19.92	59 56.46	23.61	U 7 14 11.1
8.0	26 35 29.0	+5 07 59.5	16 12.82	59 30.38	26.08	L 8 02 37.5
8.5	33 42 57.6	5 07 55.3	16 05.24	59 02.58	-27.80	U 8 15 04.2
9.0	40 43 12.3	5 03 12.3	15 57.39	58 33.76	28.82	L 9 03 31.1
9.5	47 36 02.8	4 54 09.2	15 49.44	58 04.60	29.16	U 9 15 58.3
10.0	54 21 29.8	4 41 07.7	15 41.57	57 35.70	28.90	L 10 04 25.8
10.5	60 59 44.1	+4 24 30.9	15 33.91	57 07.59	28.11	U 10 16 53.3
11.0	67 31 05.1	+4 04 43.0	15 26.59	56 40.72	-26.87	L 11 05 20.8

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
						^{12h} ^d ^h ^m ^s
Mar. 10.0	54 21 29.8	+4 41 07.7	15 41.57	57 35.70 -28.11	4.9	L 10 04 25.8 27.5
10.5	60 59 44.1	4 24 30.9	15 33.91	57 07.59 26.87		U 10 16 53.3 27.5
11.0	67 31 05.1	4 04 43.0	15 26.59	56 40.72 25.27	5.9	L 11 05 20.8 27.3
11.5	73 55 58.8	3 42 08.1	15 19.71	56 15.45 23.39		U 11 17 48.1 27.0
12.0	80 14 56.9	3 17 09.8	15 13.34	55 52.06 21.29	6.9	L 12 06 15.1 26.6
12.5	86 28 34.1	+2 50 10.9	15 07.53	55 30.77 -19.06		U 12 18 41.7 26.0
13.0	92 37 28.0	2 21 33.3	15 02.34	55 11.71 16.75	7.9	L 13 07 07.7 25.3
13.5	98 42 17.4	1 51 38.1	14 57.78	54 54.96 14.40		U 13 19 33.0 24.6
14.0	104 43 41.1	1 20 45.3	14 53.86	54 40.56 12.06	8.9	L 14 07 57.6 23.8
14.5	110 42 17.7	0 49 14.4	14 50.57	54 28.50 9.78		U 14 20 21.4 23.1
15.0	116 38 44.4	+0 17 24.1	14 47.91	54 18.72 -7.56	9.9	L 15 08 44.5 22.4
15.5	122 33 36.9	-0 14 27.4	14 45.85	54 11.16 5.44		U 15 21 06.9 21.8
16.0	128 27 28.8	0 46 02.0	14 44.36	54 05.72 3.44	10.9	L 16 09 28.7 21.3
16.5	134 20 51.1	1 17 02.0	14 43.43	54 02.28 -1.55		U 16 21 50.0 20.8
17.0	140 14 12.0	1 47 09.8	14 43.01	54 00.73 +0.21	11.9	L 17 10 10.8 20.5
17.5	146 07 57.6	-2 16 08.0	14 43.06	54 00.94 +1.83		U 17 22 31.3 20.2
18.0	152 02 30.3	2 43 39.4	14 43.56	54 02.77 3.33	12.9	L 18 10 51.5 20.0
18.5	157 58 10.1	3 09 27.0	14 44.47	54 06.10 4.71		U 18 23 11.5 20.0
19.0	163 55 14.2	3 33 14.2	14 45.75	54 10.81 5.99	13.9	L 19 11 31.5 20.2
19.5	169 53 57.1	3 54 44.9	14 47.38	54 16.80 7.15		U 19 23 51.7 20.3
20.0	175 54 30.9	-4 13 43.9	14 49.33	54 23.95 +8.26	14.9	...
20.5	181 57 05.6	4 29 56.9	14 51.58	54 32.21 9.27		L 20 12 12.0 20.6
21.0	188 01 49.6	4 43 10.7	14 54.11	54 41.48 10.26	15.9	U 21 00 32.6 21.0
21.5	194 08 49.8	4 53 13.5	14 56.90	54 51.74 11.22		L 21 12 53.6 21.6
22.0	200 18 12.4	4 59 55.3	14 59.96	55 02.96 12.14	16.9	U 22 01 15.2 22.3
22.5	206 30 03.1	-5 03 07.7	15 03.27	55 15.10 +13.07		L 22 13 37.5 23.0
23.0	212 44 27.9	5 02 44.6	15 06.83	55 28.17 14.02	17.9	U 23 02 00.5 23.8
23.5	219 01 33.2	4 58 41.8	15 10.65	55 42.19 14.96		L 23 14 24.3 24.7
24.0	225 21 26.5	4 50 57.4	15 14.72	55 57.15 15.91	18.9	U 24 02 49.0 25.7
24.5	231 44 16.5	4 39 32.1	15 19.06	56 13.06 16.86		L 24 15 14.7 26.5
25.0	238 10 13.3	-4 24 29.0	15 23.65	56 29.92 +17.78	19.9	U 25 03 41.2 27.4
25.5	244 39 28.7	4 05 53.6	15 28.50	56 47.70 18.67		L 25 16 08.6 28.1
26.0	251 12 15.8	3 43 54.5	15 33.58	57 06.37 19.46	20.9	U 26 04 36.7 28.7
26.5	257 48 48.6	3 18 42.8	15 38.88	57 25.83 20.13		L 26 17 05.4 29.1
27.0	264 29 22.0	2 50 32.9	15 44.37	57 45.96 20.62	21.9	U 27 05 34.5 29.2
27.5	271 14 10.8	-2 19 42.1	15 49.99	58 06.58 +20.90		L 27 18 03.7 29.2
28.0	278 03 28.5	1 46 31.3	15 55.68	58 27.48 20.86	22.9	U 28 06 32.9 29.0
28.5	284 57 26.7	1 11 24.8	16 01.36	58 48.34 20.47		L 28 19 01.9 28.6
29.0	291 56 13.4	-0 34 50.3	16 06.94	59 08.81 19.67	23.9	U 29 07 30.5 28.1
29.5	298 59 52.1	+0 02 40.6	16 12.30	59 28.48 18.41		L 29 19 58.6 27.6
30.0	306 08 19.9	+0 40 33.0	16 17.31	59 46.89 +16.64	24.9	U 30 08 26.2 27.0
30.5	313 21 26.5	1 18 09.2	16 21.85	60 03.53 14.36		L 30 20 53.2 26.6
31.0	320 38 52.4	1 54 49.2	16 25.76	60 17.89 11.58	25.9	U 31 09 19.8 26.2
31.5	328 00 08.9	2 29 51.6	16 28.91	60 29.47 8.32		L 31 21 46.0 26.0
Apr. 1.0	335 24 37.2	3 02 35.1	16 31.18	60 37.79 4.68	26.9	U 1 10 12.0 25.7
1.5	342 51 28.6	+3 32 20.1	16 32.46	60 42.47 +0.74		L 1 22 37.7 25.8
2.0	350 19 46.2	+3 58 30.3	16 32.66	60 43.21	27.9	U 2 11 03.5 25.8

MOON, 1935

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
Apr. 1-0	335 24 37.2	+3 02 35.1	16 31.18	60 37.79	26.9	U 1 10 12.0
1-5	342 51 28.6	3 32 20.1	16 32.46	60 42.47 + 4.68		L 1 22 37.7
2-0	350 19 46.2	3 58 30.3	16 32.66	60 43.21 + 0.74	27.9	U 2 11 03.5
2-5	357 48 26.0	4 20 34.3	16 31.74	60 39.83 - 3.38		L 2 23 29.3
3-0	5 16 19.5	4 38 07.0	16 29.69	60 32.32 7.51	28.9	U 3 11 55.4
3-5	12 42 16.9	+4 50 50.9	16 26.55	60 20.80 11.52		...
4-0	20 05 09.9	4 58 36.6	16 22.39	60 05.51 -15.29	0.5	L 4 00 21.7
4-5	27 23 55.2	5 01 22.6	16 17.31	59 46.87 18.64		U 4 12 48.5
5-0	34 37 36.8	4 59 15.4	16 11.45	59 25.37 21.50	1.5	L 5 01 15.7
5-5	41 45 28.3	4 52 27.9	16 04.96	59 01.56 23.81		U 5 13 43.4
6-0	48 46 54.5	+4 41 18.8	15 58.02	58 36.05 25.51	2.5	L 6 02 11.3
6-5	55 41 31.8	4 26 10.4	15 50.77	58 09.47 -26.58		U 6 14 39.5
7-0	62 29 08.3	4 07 28.4	15 43.41	57 42.44 27.03	3.5	L 7 03 07.9
7-5	69 09 43.2	3 45 39.4	15 36.08	57 15.53 26.91		U 7 15 36.2
8-0	75 43 25.7	3 21 10.8	15 28.92	56 49.26 26.27	4.5	L 8 04 04.2
8-5	82 10 33.8	+2 54 29.3	15 22.07	56 24.10 25.16		U 8 16 31.9
9-0	88 31 32.5	2 26 00.9	15 15.62	56 00.43 -23.67	5.5	L 9 04 59.0
9-5	94 46 53.0	1 56 10.1	15 09.66	55 38.58 21.85		U 9 17 25.3
10-0	100 57 10.4	1 25 20.1	15 04.28	55 18.81 19.77	6.5	L 10 05 50.9
10-5	107 03 03.4	0 53 52.3	14 59.51	55 01.32 17.49		U 10 18 15.6
11-0	113 05 12.4	+0 22 07.0	14 55.40	54 46.23 15.09	7.5	L 11 06 39.6
11-5	119 04 18.9	-0 09 37.0	14 51.97	54 33.64 -12.59		U 11 19 02.7
12-0	125 01 04.7	0 41 01.6	14 49.23	54 23.59 10.05	8.5	L 12 07 25.1
12-5	130 56 10.4	1 11 49.8	14 47.18	54 16.06 7.53		U 12 19 46.8
13-0	136 50 16.0	1 41 45.1	14 45.81	54 11.01 5.05	9.5	L 13 08 07.9
13-5	142 43 59.6	-2 10 31.4	14 45.09	54 08.38 2.63		U 13 20 28.6
14-0	148 37 56.7	2 37 53.0	14 45.00	54 08.05 -0.33	10.5	L 14 08 49.0
14-5	154 32 40.5	3 03 34.2	14 45.51	54 09.91 +1.86		U 14 21 09.1
15-0	160 28 40.9	3 27 19.6	14 46.57	54 13.82 3.91	11.5	L 15 09 29.2
15-5	166 26 24.7	3 48 54.0	14 48.14	54 19.59 5.77		U 15 21 49.3
16-0	172 26 15.1	-4 08 02.5	14 50.18	54 27.08 7.49	12.5	L 16 10 09.5
16-5	178 28 31.6	4 24 30.6	14 52.64	54 36.08 +9.00		U 16 22 30.0
17-0	184 33 29.9	4 38 04.5	14 55.45	54 46.40 10.32	13.5	L 17 10 50.9
17-5	190 41 21.8	4 48 31.6	14 58.57	54 57.86 11.46		U 17 23 12.4
18-0	196 52 15.7	4 55 40.2	15 01.95	55 10.27 12.41	14.5	L 18 11 34.4
18-5	203 06 16.5	-4 59 20.7	15 05.54	55 23.46 13.19		U 18 23 57.2
19-0	209 23 25.9	4 59 25.0	15 09.30	55 37.25 +13.79	15.5	...
19-5	215 43 43.4	4 55 47.9	15 13.18	55 51.50 14.25		L 19 12 20.8
20-0	222 07 06.1	4 48 26.5	15 17.15	56 06.06 14.56	16.5	U 20 00 45.3
20-5	228 33 30.0	4 37 21.1	15 21.18	56 20.84 14.78		L 20 13 10.8
21-0	235 02 50.1	-4 22 35.0	15 25.23	56 35.73 14.89	17.5	U 21 01 37.1
21-5	241 35 01.7	4 04 14.8	15 29.30	56 50.66 +14.93		L 21 14 04.3
22-0	248 10 00.7	3 42 30.5	15 33.36	57 05.57 14.91	18.5	U 22 02 32.3
22-5	254 47 43.7	3 17 35.5	15 37.41	57 20.41 14.84		L 22 15 00.8
23-0	261 28 09.3	2 49 46.3	15 41.42	57 35.14 14.73	19.5	U 23 03 29.7
23-5	268 11 17.1	-2 19 22.7	15 45.39	57 49.72 14.58		L 23 15 58.8
24-0	274 57 08.9	-1 46 47.4	15 49.31	58 04.12 +14.40	20.5	U 24 04 27.8

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
						^{12h} ^{d h m +}
Apr. 24.0	274 57 08.9	-1 46 47.4	15 49.31	58 04.12 +14.13	20.5	U 24 04 27.8 28.8
24.5	281 45 47.7	1 12 25.6	15 53.17	58 18.25 13.80		L 24 16 56.6 28.4
25.0	288 37 16.9	0 36 45.2	15 56.93	58 32.05 13.36	21.5	U 25 05 25.0 27.8
25.5	295 31 41.1	-0 00 16.3	16 00.57	58 45.41 12.76		L 25 17 52.8 27.2
26.0	302 29 03.4	+0 36 29.1	16 04.04	58 58.17 11.99	22.5	U 26 06 20.0 26.6
26.5	309 29 25.7	+1 12 57.3	16 07.31	59 10.16 +11.02		L 26 18 46.6 26.0
27.0	316 32 46.6	1 48 33.7	16 10.31	59 21.18 9.80	23.5	U 27 07 12.6 25.6
27.5	323 39 01.1	2 22 42.9	16 12.98	59 30.98 8.29		L 27 19 38.2 25.2
28.0	330 47 59.2	2 54 49.9	16 15.24	59 39.27 6.52	24.5	U 28 08 03.4 25.0
28.5	337 59 24.4	3 24 20.3	16 17.01	59 45.79 4.45		L 28 20 28.4 24.9
29.0	345 12 54.0	+3 50 41.9	16 18.23	59 50.24 +2.13	25.5	U 29 08 53.3 25.0
29.5	352 27 58.1	4 13 25.1	16 18.81	59 52.37 0.43		L 29 21 18.3 25.2
30.0	359 44 00.3	4 32 04.4	16 18.69	59 51.94 3.02	26.5	U 30 09 43.5 25.5
30.5	7 00 18.0	4 46 19.2	16 17.83	59 48.77 6.02		L 30 22 09.0 25.9
May 1.0	14 16 04.2	4 55 54.8	16 16.19	59 42.75 8.88	27.5	U 1 10 34.9 26.5
1.5	21 30 28.4	+5 00 42.9	16 13.77	59 33.87 11.70		L 1 23 01.4 26.9
2.0	28 42 39.5	5 00 41.7	16 10.58	59 22.17 14.34	28.5	U 2 11 28.3 27.5
2.5	35 51 47.5	4 55 56.6	16 06.67	59 07.83 16.75		L 2 23 55.8 28.1
3.0	42 57 05.5	4 46 38.7	16 02.11	58 51.08 18.84	0.1	...
3.5	49 57 52.2	4 33 05.2	15 56.98	58 32.24 20.54		U 3 12 23.9 28.4
4.0	56 53 33.2	+4 15 37.4	15 51.38	58 11.70 21.80	1.1	L 4 00 52.3 28.7
4.5	63 43 42.0	3 54 40.2	15 45.44	57 49.90 22.61		U 4 13 21.0 28.7
5.0	70 28 01.1	3 30 40.9	15 39.28	57 27.29 22.95	2.1	L 5 01 49.7 28.5
5.5	77 06 21.8	3 04 07.7	15 33.03	57 04.34 22.83		U 5 14 18.2 28.1
6.0	83 38 43.9	2 35 29.1	15 26.81	56 41.51 22.28	3.1	L 6 02 46.3 27.5
6.5	90 05 15.8	+2 05 13.3	15 20.74	56 19.23 21.32		U 6 15 13.8 26.8
7.0	96 26 13.0	1 33 47.1	15 14.93	55 57.91 19.98	4.1	L 7 03 40.6 25.9
7.5	102 41 57.5	1 01 35.7	15 09.49	55 37.93 18.34		U 7 16 06.5 25.0
8.0	108 52 56.4	+0 29 02.8	15 04.49	55 19.59 16.41	5.1	L 8 04 31.5 24.1
8.5	114 59 41.6	-0 03 29.9	15 00.02	55 03.18 14.28		U 8 16 55.6 23.3
9.0	121 02 48.2	-0 35 42.4	14 56.13	54 48.90 11.95	6.1	L 9 05 18.9 22.5
9.5	127 02 53.9	1 07 15.8	14 52.87	54 36.95 9.49		U 9 17 41.4 21.7
10.0	133 00 38.0	1 37 53.1	14 50.28	54 27.46 6.95	7.1	L 10 06 03.1 21.1
10.5	138 56 40.7	2 07 18.1	14 48.39	54 20.51 4.37		U 10 18 24.2 20.7
11.0	144 51 42.6	2 35 15.6	14 47.20	54 16.14 1.78	8.1	L 11 06 44.9 20.3
11.5	150 46 23.8	-3 01 31.0	14 46.72	54 14.36 0.79		U 11 19 05.2 20.1
12.0	156 41 23.4	3 25 50.2	14 46.94	54 15.15 3.29	9.1	L 12 07 25.3 20.0
12.5	162 37 19.0	3 47 59.3	14 47.83	54 18.44 5.67		U 12 19 45.3 20.1
13.0	168 34 46.1	4 07 44.7	14 49.38	54 24.11 7.94	10.1	L 13 08 05.4 20.2
13.5	174 34 17.7	4 24 53.1	14 51.54	54 32.05 10.02		U 13 20 25.6 20.6
14.0	180 36 23.7	-4 39 11.5	14 54.27	54 42.07 11.93	11.1	L 14 08 46.2 21.0
14.5	186 41 30.5	4 50 27.2	14 57.52	54 54.00 13.60		U 14 21 07.2 21.6
15.0	192 50 00.6	4 58 28.3	15 01.22	55 07.60 15.02	12.1	L 15 09 28.8 22.3
15.5	199 02 12.0	5 03 03.8	15 05.31	55 22.62 16.18		U 15 21 51.1 23.1
16.0	205 18 18.4	5 04 04.2	15 09.72	55 38.80 17.05	13.1	L 16 10 14.2 24.0
16.5	211 38 28.5	-5 01 21.8	15 14.37	55 55.85 17.63		U 16 22 38.2 25.1
17.0	218 02 46.5	-4 54 51.1	15 19.17	56 13.48	14.1	L 17 11 03.3

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich	
May	17-0	218 02 46.5	-4 54 51.1	15 19 17	56 13.48	14.1	L 17 11 03.3
	17-5	224 31 11.5	4 44 29.6	15 24 05	56 31.39	15.1	U 17 23 29.3
	18-0	231 03 38.7	4 30 17.8	15 28 92	56 49.28	16.1	L 18 11 56.3
	18-5	237 39 59.1	4 12 20.4	15 33 72	57 06.88	17.05	...
	19-0	244 20 00.3	3 50 45.6	15 38 37	57 23.93	18.1	U 19 00 24.3
	19-5	251 03 27.5	-3 25 46.2	15 42 80	57 40.19	19.1	L 19 12 53.0
	20-0	257 50 04.0	2 57 39.0	15 46 96	57 55.47	20.1	U 20 01 22.3
	20-5	264 39 32.3	2 26 45.1	15 50 81	58 09.61	21.1	L 20 13 51.9
	21-0	271 31 34.5	1 53 29.5	15 54 32	58 22.50	22.1	U 21 02 21.5
	21-5	278 25 53.8	1 18 20.4	15 57 47	58 34.04	23.1	L 21 14 51.0
	22-0	285 22 13.8	-0 41 48.9	16 00 24	58 44.22	24.1	U 22 03 20.0
	22-5	292 20 20.1	-0 04 28.5	16 02 64	58 53.01	25.1	L 22 15 48.4
	23-0	299 19 59.7	+0 33 06.4	16 04 66	59 00.44	26.1	U 23 04 16.2
	23-5	306 21 01.2	1 10 19.9	16 06 32	59 06.52	27.1	L 23 16 43.2
	24-0	313 23 14.3	1 46 36.6	16 07 62	59 11.30	28.1	U 24 05 09.5
	24-5	320 26 29.9	+2 21 21.6	16 08 58	59 14.83	29.1	L 24 17 35.2
	25-0	327 30 38.5	2 54 01.4	16 09 20	59 17.12	30.1	U 25 06 00.3
	25-5	334 35 30.6	3 24 04.1	16 09 49	59 18.19	31.1	L 25 18 25.0
	26-0	341 40 55.2	3 51 00.8	16 09 45	59 18.04	32.1	U 26 06 49.4
	26-5	348 46 39.6	4 14 25.1	16 09 07	59 16.63	33.1	L 26 19 13.7
	27-0	355 52 28.6	+4 33 54.8	16 08 33	59 13.93	34.1	U 27 07 38.1
	27-5	2 58 04.3	4 49 11.3	16 07 23	59 09.87	35.1	L 27 20 02.7
	28-0	10 03 05.9	5 00 01.1	16 05 74	59 04.40	36.1	U 28 08 27.6
	28-5	17 07 09.9	5 06 14.9	16 03 85	58 57.48	37.1	L 28 20 52.9
29-0	24 09 50.5	5 07 49.2	16 01 55	58 49.03	38.1	U 29 09 18.8	
29-5	31 10 40.0	+5 04 45.5	15 58 84	58 39.07	39.1	L 29 21 45.2	
30-0	38 09 09.9	4 57 10.4	15 55 71	58 27.58	40.1	U 30 10 12.3	
30-5	45 04 51.8	4 45 15.6	15 52 17	58 14.61	41.1	L 30 22 39.9	
31-0	51 57 18.6	4 29 17.4	15 48 27	58 00.27	42.1	U 31 11 08.0	
31-5	58 46 05.4	4 09 35.9	15 44 02	57 44.68	43.1	L 31 23 36.4	
June	1-0	65 30 50.6	+3 46 34.6	15 39 48	57 28.03	44.1	...
	1-5	72 11 16.6	3 20 39.2	15 34 71	57 10.53	45.1	U 1 12 04.9
	2-0	78 47 10.9	2 52 17.1	15 29 79	56 52.44	46.1	L 2 00 33.3
	2-5	85 18 26.0	2 21 56.4	15 24 77	56 34.04	47.1	U 2 13 01.4
	3-0	91 44 59.9	1 50 05.5	15 19 76	56 15.65	48.1	L 3 01 28.9
	3-5	98 06 56.1	+1 17 11.9	15 14 84	55 57.57	49.1	U 3 13 55.7
	4-0	104 24 23.7	0 43 42.1	15 10 08	55 40.11	50.1	L 4 02 21.8
	4-5	110 37 36.4	+0 10 01.1	15 05 58	55 23.58	51.1	U 4 14 46.9
	5-0	116 46 53.0	-0 23 27.8	15 01 41	55 08.27	52.1	L 5 03 11.1
	5-5	122 52 36.4	0 56 22.9	14 57 64	54 54.46	53.1	U 5 15 34.5
	6-0	128 55 13.1	-1 28 24.6	14 54 36	54 42.40	54.1	L 6 03 57.0
	6-5	134 55 12.7	1 59 14.7	14 51 61	54 32.30	55.1	U 6 16 18.8
	7-0	140 53 07.5	2 28 36.6	14 49 44	54 24.35	56.1	L 7 04 40.0
	7-5	146 49 31.9	2 56 15.1	14 47 90	54 18.71	57.1	U 7 17 00.6
	8-0	152 45 01.7	3 21 55.9	14 47 03	54 15.51	58.1	L 8 05 20.9
	8-5	158 40 14.2	-3 45 25.8	14 46 84	54 14.83	59.1	U 8 17 41.0
	9-0	164 35 46.6	-4 06 32.1	14 47 36	54 16.72	60.1	L 9 06 00.9

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
						^{12h} ^d ^h ^m ^s
June 9.0	164° 35' 46.6"	-4° 06' 32.1"	14' 47.36"	54' 16.72" + 4.48"	7.7	L 9 06 00.9 U 9 18 20.9
9.5	170 32 16.5	4 25 02.8	14 48.58	54 21.20 + 7.05	8.7	L 10 06 41.0 U 10 19 01.4
10.0	176 30 20.9	4 40 46.2	14 50.50	54 28.25 + 9.56	9.7	L 11 07 22.3
10.5	182 30 35.8	4 53 30.8	14 53.11	54 37.81 + 11.98	10.7	U 11 19 43.8
11.0	188 33 35.5	5 03 05.9	14 56.37	54 49.79 + 14.22	11.7	L 12 08 06.0 U 12 20 29.1
11.5	194 39 52.1	-5 09 20.9	15 00.25	55 04.01 + 16.30	12.7	L 13 08 53.1 U 13 21 18.2
12.0	200 49 55.0	5 12 06.4	15 04.69	55 20.31 + 18.14	13.7	L 14 09 44.4 U 14 22 11.7
12.5	207 04 09.9	5 11 13.3	15 09.63	55 38.45 + 19.69	14.7	L 15 10 40.0 U 15 23 09.2
13.0	213 22 58.7	5 06 34.4	15 14.99	55 58.14 + 20.93	15.7	L 16 11 39.0
13.5	219 46 38.4	4 58 04.1	15 20.69	56 19.07 + 21.80	16.7	...
14.0	226 15 20.9	-4 45 39.5	15 26.63	56 40.87 + 22.28	17.7	U 17 00 09.2
14.5	232 49 12.5	4 29 20.7	15 32.70	57 03.15 + 22.33	18.7	L 17 12 39.5
15.0	239 28 13.2	4 09 11.3	15 38.79	57 25.48 + 21.93	19.7	U 18 01 09.7
15.5	246 12 17.5	3 45 19.3	15 44.76	57 47.41 + 21.11	20.7	L 18 13 39.4
16.0	253 01 13.6	3 17 57.4	15 50.51	58 08.52 + 19.85	21.7	U 19 02 08.4
16.5	259 54 43.9	-2 47 23.5	15 55.92	58 28.37 + 18.19	22.7	L 19 14 36.7
17.0	266 52 25.8	2 14 00.3	16 00.88	58 46.56 + 16.17	23.7	U 20 03 04.2
17.5	273 53 52.1	1 38 15.9	16 05.28	59 02.73 + 13.87	24.7	L 20 15 30.8
18.0	280 58 32.3	1 00 42.5	16 09.06	59 16.60 + 11.38	25.7	U 21 03 56.8
18.5	288 05 53.4	-0 21 56.3	16 12.16	59 27.98 + 8.73	26.7	L 21 16 22.2
19.0	295 15 20.6	+0 17 23.6	16 14.54	59 36.71 + 6.04	27.7	U 22 04 47.1
19.5	302 26 19.3	0 56 36.8	16 16.18	59 42.75 + 3.37	28.7	L 22 17 11.6
20.0	309 38 15.2	1 35 02.2	16 17.10	59 46.12 + 0.82	29.7	U 23 05 36.0
20.5	316 50 35.3	2 11 59.6	16 17.33	59 46.94 + 1.57	30.7	L 23 18 00.4
21.0	324 02 49.1	2 46 50.9	16 16.90	59 45.37 + 3.75	31.7	U 24 06 24.9
21.5	331 14 28.4	+3 19 00.9	16 15.88	59 41.62 + 5.69	32.7	L 24 18 49.7
22.0	338 25 07.9	3 47 58.5	16 14.33	59 35.93 + 7.39	33.7	U 25 07 14.8
22.5	345 34 25.0	4 13 16.6	16 12.32	59 28.54 + 8.82	34.7	L 25 19 40.4
23.0	352 42 00.0	4 34 33.3	16 09.91	59 19.72 + 10.04	35.7	U 26 08 06.6
23.5	359 47 35.9	4 51 31.7	16 07.18	59 09.68 + 11.04	36.7	L 26 20 33.2
24.0	6 50 57.8	+5 03 59.7	16 04.17	58 58.64 + 11.86	37.7	U 27 09 00.4
24.5	13 51 52.7	5 11 50.5	16 00.94	58 46.78 + 12.53	38.7	L 27 21 28.0
25.0	20 50 09.4	5 15 02.0	15 57.52	58 34.25 + 13.09	39.7	U 28 09 55.9
25.5	27 45 37.6	5 13 36.6	15 53.96	58 21.16 + 13.55	40.7	L 28 22 24.0
26.0	34 38 08.4	5 07 41.1	15 50.27	58 07.61 + 13.94	41.7	U 29 10 51.9
26.5	41 27 33.6	+4 57 26.3	15 46.47	57 53.67 + 14.28	42.7	L 29 23 19.5
27.0	48 13 45.9	4 43 06.5	15 42.58	57 39.39 + 14.57	43.7	U 30 11 46.7
27.5	54 56 38.5	4 24 59.1	15 38.61	57 24.82 + 14.82	44.7	...
28.0	61 36 05.7	4 03 24.5	15 34.57	57 10.00 + 15.01	45.7	L 1 00 13.2
28.5	68 12 02.7	3 38 45.2	15 30.48	56 54.99 + 15.14	46.7	U 1 12 38.9
29.0	74 44 26.1	+3 11 25.6	15 26.36	56 39.85 + 15.20	47.7	L 2 01 03.8
29.5	81 13 13.6	2 41 51.2	15 22.21	56 24.65 + 15.15	48.7	...
30.0	87 38 24.8	2 10 28.5	15 18.09	56 09.50 + 15.00	49.7	...
30.5	94 00 00.9	1 37 44.2	15 14.00	55 54.50 + 14.69	50.7	...
July 1.0	100 18 05.6	1 04 04.7	15 10.00	55 39.81 + 14.23	51.7	...
1.5	106 32 44.7	+0 29 56.0	15 06.12	55 25.58 + 13.61	52.7	...
2.0	112 44 06.5	-0 04 17.1	15 02.41	55 11.97	53.7	...

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
July 1-0	100 18 05.6	+1 04 04.7	15 10.00	55 39.81	0.2	L 1 00 13.2
1-5	106 32 44.7	+0 29 56.0	15 06.12	55 25.58	0.2	U 1 12 38.9
2-0	112 44 06.5	-0 04 17.1	15 02.41	55 11.97	1.2	L 2 01 03.8
2-5	118 52 21.8	0 38 11.0	14 58.93	54 59.19	1.2	U 2 13 27.9
3-0	124 57 44.3	1 11 23.4	14 55.72	54 47.40	2.2	L 3 01 51.1
3-5	131 00 30.0	-1 43 33.8	14 52.84	54 36.82	2.2	U 3 14 13.5
4-0	137 00 57.9	2 14 23.2	14 50.35	54 27.67	3.2	L 4 02 35.3
4-5	142 59 29.3	2 43 34.4	14 48.29	54 20.12	3.2	U 4 14 56.4
5-0	148 56 27.8	3 10 51.4	14 46.71	54 14.35	4.2	L 5 03 17.0
5-5	154 52 19.6	3 36 00.0	14 45.68	54 10.54	4.2	U 5 15 37.3
6-0	160 47 32.8	-3 58 47.0	14 45.22	54 08.85	5.2	L 6 03 57.3
6-5	166 42 37.5	4 19 00.4	14 45.37	54 09.41	5.2	U 6 16 17.1
7-0	172 38 05.1	4 36 29.2	14 46.17	54 12.34	6.2	L 7 04 37.0
7-5	178 34 28.4	4 51 03.0	14 47.63	54 17.72	6.2	U 7 16 57.0
8-0	184 32 21.4	5 02 32.3	14 49.78	54 25.61	7.2	L 8 05 17.3
8-5	190 32 18.4	-5 10 48.1	14 52.62	54 36.03	7.2	U 8 17 38.0
9-0	196 34 53.9	5 15 42.1	14 56.15	54 48.97	8.2	L 9 05 59.3
9-5	202 40 41.9	5 17 06.5	15 00.34	55 04.37	8.2	U 9 18 21.2
10-0	208 50 15.6	5 14 54.4	15 05.17	55 22.11	9.2	L 10 06 44.0
10-5	215 04 06.4	5 08 59.9	15 10.60	55 42.03	9.2	U 10 19 07.7
11-0	221 22 43.4	-4 59 18.6	15 16.57	56 03.92	10.2	L 11 07 32.5
11-5	227 46 32.3	4 45 47.9	15 22.99	56 27.50	10.2	U 11 19 58.3
12-0	234 15 55.2	4 28 27.4	15 29.78	56 52.44	11.2	L 12 08 25.3
12-5	240 51 09.0	4 07 19.9	15 36.83	57 18.31	11.2	U 12 20 53.4
13-0	247 32 24.7	3 42 32.0	15 44.01	57 44.66	12.2	L 13 09 22.4
13-5	254 19 47.0	-3 14 14.5	15 51.18	58 10.97	12.2	U 13 21 52.1
14-0	261 13 13.2	2 42 43.1	15 58.18	58 36.67	13.2	L 14 10 22.4
14-5	268 12 32.7	2 08 19.3	16 04.86	59 01.18	13.2	U 14 22 52.9
15-0	275 17 26.6	1 31 29.8	16 11.05	59 23.90	14.2	L 15 11 23.4
15-5	282 27 27.9	0 52 47.3	16 16.60	59 44.28	14.2	U 15 23 53.6
16-0	289 42 02.0	-0 12 49.3	16 21.37	60 01.78	15.2	...
16-5	297 00 27.1	+0 27 42.4	16 25.24	60 15.98	15.2	L 16 12 23.2
17-0	304 21 55.3	1 08 03.2	16 28.12	60 26.55	16.2	U 17 00 52.1
17-5	311 45 34.3	1 47 27.0	16 29.95	60 33.27	16.2	L 17 13 20.3
18-0	319 10 29.2	2 25 08.1	16 30.71	60 36.06	17.2	U 18 01 47.7
18-5	326 35 44.1	+3 00 23.2	16 30.42	60 34.99	17.2	L 18 14 14.4
19-0	334 00 24.0	3 32 32.6	16 29.12	60 30.23	18.2	U 19 02 40.5
19-5	341 23 36.7	4 01 02.2	16 26.91	60 22.10	18.2	L 19 15 06.2
20-0	348 44 34.6	4 25 23.8	16 23.87	60 10.95	19.2	U 20 03 31.5
20-5	356 02 35.6	4 45 16.1	16 20.13	59 57.23	19.2	L 20 15 56.5
21-0	3 17 04.1	+5 00 24.9	16 15.82	59 41.41	20.2	U 21 04 21.5
21-5	10 27 31.5	5 10 42.6	16 11.07	59 23.95	20.2	L 21 16 46.6
22-0	17 33 36.4	5 16 07.8	16 05.99	59 05.31	21.2	U 22 05 11.9
22-5	24 35 04.1	5 16 44.7	16 00.70	58 45.90	21.2	L 22 17 37.5
23-0	31 31 46.2	5 12 42.2	15 55.30	58 26.09	22.2	U 23 06 03.4
23-5	38 23 40.0	+5 04 13.3	15 49.88	58 06.21	22.2	L 23 18 29.8
24-0	45 10 47.6	+4 51 34.0	15 44.51	57 46.50	23.2	U 24 06 56.6

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich	
July	24.0	45° 10' 47.6"	+4 51 34.0	15 44.51	57 46.50	23.2	U 24 06 56.6 ^{12h} L 24 19 23.8 ^{+m}
	24.5	51 53 14.8	4 35 03.2	15 39.25	57 27.18 ^{-19.32}	24.2	U 25 07 51.3 ^{27.5} L 25 20 18.9 ^{27.6}
	25.0	58 31 10.7	4 15 01.7	15 34.13	57 08.39 ^{18.79}	25.2	U 26 08 46.5 ^{27.6} L 26 21 13.9 ^{27.4}
	25.5	65 04 46.3	3 51 51.5	15 29.19	56 50.25 ^{18.14}	26.2	U 27 09 41.0 ^{27.1} L 27 22 07.6 ^{26.6}
	26.0	71 34 14.3	3 25 56.0	15 24.45	56 32.84 ^{17.41}	27.2	U 28 10 33.6 ^{26.0} L 28 22 58.8 ^{25.2}
	26.5	77 59 48.4	+2 57 39.2	15 19.91	56 16.20 ^{16.64}	28.2	U 29 11 23.2 ^{24.4} L 29 23 46.9 ^{23.7}
	27.0	84 21 42.6	2 27 25.7	15 15.60	56 00.36 ^{-15.84}	29.2	U 30 12 09.8 ^{22.1} L 31 00 31.9 ^{21.5}
	27.5	90 40 11.0	1 55 40.1	15 11.50	55 45.33 ^{15.03}	0.6	U 31 12 53.4 ^{21.0} L 1 01 14.4 ^{20.5}
	28.0	96 55 27.5	1 22 47.1	15 07.63	55 31.13 ^{14.20}	1.6	U 1 13 34.9 ^{20.2} L 2 01 55.1 ^{20.0}
	28.5	103 07 45.8	0 49 11.2	15 03.99	55 17.77 ^{13.36}	2.6	U 2 14 15.1 ^{19.8} L 3 02 34.9 ^{19.8}
	29.0	109 17 19.2	+0 15 16.0	15 00.59	55 05.27 ^{12.50}	3.6	U 3 14 54.7 ^{19.8} L 4 03 14.7 ^{20.0}
	29.5	115 24 20.9	-0 18 35.1	14 57.42	54 53.65 ^{10.68}	4.6	U 4 15 34.9 ^{20.2} L 5 03 55.5 ^{20.6}
	30.0	121 29 03.6	0 51 59.6	14 54.51	54 42.97 ^{9.71}	5.6	U 5 16 16.7 ^{21.2} L 6 04 38.4 ^{21.7}
	30.5	127 31 40.6	1 24 36.4	14 51.87	54 33.26 ^{8.64}	6.6	U 6 17 00.9 ^{22.5} L 7 05 24.3 ^{23.4}
	31.0	133 32 24.8	1 56 05.2	14 49.51	54 24.62 ^{7.48}	7.6	U 7 17 48.6 ^{24.3} L 8 06 14.0 ^{25.4}
Aug.	31.5	139 31 30.2	-2 26 07.3	14 47.47	54 17.14 ^{-6.25}	8.6	U 8 18 40.3 ^{26.3} L 9 07 07.7 ^{27.4}
	1.0	145 29 11.3	2 54 25.1	14 45.77	54 10.89 ^{4.88}	9.6	U 9 19 36.0 ^{28.3} L 10 08 05.1 ^{29.1}
	1.5	151 25 43.5	3 20 42.7	14 44.44	54 06.01 ^{3.38}	10.6	U 10 20 34.7 ^{30.0} L 11 09 04.7 ^{30.1}
	2.0	157 21 23.7	3 44 45.5	14 43.52	54 02.63 ^{1.76}	11.6	U 11 21 34.8 ^{29.9} L 12 10 04.7 ^{29.6}
	2.5	163 16 29.9	4 06 20.4	14 43.04	54 00.87 ^{0.01}	12.6	U 12 22 34.3 ^{29.1} L 13 11 03.4 ^{28.5}
	3.0	169 11 22.1	-4 25 15.6	14 43.04	54 00.86 ^{+1.87}	13.6	U 13 23 31.9 ^{27.9} L 14 11 59.8 ^{27.4}
	3.5	175 06 21.6	4 41 20.4	14 43.55	54 02.73 ^{3.88}	14.6	U 15 00 27.2 ^{26.8} L 15 12 54.0 ^{26.4}
	4.0	181 01 51.8	4 54 25.7	14 44.61	54 06.61 ^{6.01}	15.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
	4.5	186 58 17.7	5 04 23.2	14 46.24	54 12.62 ^{8.24}	16.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
	5.0	192 56 06.2	5 11 05.8	14 48.49	54 20.86 ^{10.53}	17.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
	5.5	198 55 45.7	-5 14 27.3	14 51.36	54 31.39 ^{+12.88}	18.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
	6.0	204 57 46.1	5 14 22.4	14 54.87	54 44.27 ^{15.26}	19.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
	6.5	211 02 38.7	5 10 46.7	14 59.02	54 59.53 ^{17.61}	20.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
	7.0	217 10 55.5	5 03 36.9	15 03.82	55 17.14 ^{19.90}	21.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
	7.5	223 23 08.3	4 52 51.1	15 09.24	55 37.04 ^{22.07}	22.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
	8.0	229 39 49.4	-4 38 28.5	15 15.26	55 59.11 ^{+24.06}	23.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
	8.5	236 01 29.8	4 20 30.4	15 21.81	56 23.17 ^{25.80}	24.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
	9.0	242 28 38.5	3 59 00.3	15 28.84	56 48.97 ^{27.21}	25.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
	9.5	249 01 41.9	3 34 04.6	15 36.25	57 16.18 ^{28.23}	26.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
	10.0	255 41 02.1	3 05 52.8	15 43.95	57 44.41 ^{28.76}	27.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}
10.5	262 26 56.4	-2 34 38.7	15 51.78	58 13.17 ^{+28.74}	28.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}	
11.0	269 19 35.3	2 00 40.8	15 59.61	58 41.91 ^{28.09}	29.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}	
11.5	276 19 01.7	1 24 22.4	16 07.26	59 10.00 ^{26.77}	30.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}	
12.0	283 25 09.1	0 46 12.5	16 14.56	59 36.77 ^{24.76}	31.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}	
12.5	290 37 41.1	-0 06 45.7	16 21.30	60 01.53 ^{22.04}	32.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}	
13.0	297 56 10.6	+0 33 18.6	16 27.31	60 23.57 ^{+18.69}	33.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}	
13.5	305 19 59.1	1 13 16.5	16 32.40	60 42.26 ^{14.75}	34.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}	
14.0	312 48 17.6	1 52 21.4	16 36.42	60 57.01 ^{10.37}	35.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}	
14.5	320 20 07.3	2 29 45.3	16 39.24	61 07.38 ^{5.67}	36.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}	
15.0	327 54 21.4	3 04 41.1	16 40.79	61 13.05 ^{+0.85}	37.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}	
15.5	335 29 47.4	+3 36 24.9	16 41.02	61 13.90 ^{-3.92}	38.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}	
16.0	343 05 10.1	+4 04 17.6	16 39.95	61 09.98	39.6	U 16 01 20.4 ^{26.4} L 16 01 20.4 ^{26.4}	

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
Aug. 16.0	343 05 10.1	+4 04 17.6	16 39.95	61 09.98	16.6	U 16 01 20.4 ^{d h m +}
16.5	350 39 14.5	4 27 47.1	16 37.64	61 01.50 - 8.48		L 16 13 46.5 ^m
17.0	358 10 49.3	4 46 29.5	16 34.19	60 48.84 12.66	17.6	U 17 02 12.5
17.5	5 38 49.5	5 00 09.4	16 29.74	60 32.50 16.34		L 17 14 38.5
18.0	13 02 18.7	5 08 39.7	16 24.44	60 13.05 19.45	18.6	U 18 03 04.6
18.5	20 20 30.8	+5 12 01.7	16 18.47	59 51.14 21.91		L 18 15 30.9
19.0	27 32 50.8	5 10 23.7	16 12.00	59 27.40 -23.74	19.6	U 19 03 57.4
19.5	34 38 55.3	5 03 59.8	16 05.21	59 02.46 24.94		L 19 16 24.3
20.0	41 38 31.5	4 53 08.7	15 58.25	58 36.90 25.56	20.6	U 20 04 51.4
20.5	48 31 36.7	4 38 12.1	15 51.25	58 11.24 25.66		L 20 17 18.9
21.0	55 18 16.8	+4 19 34.1	15 44.35	57 45.91 25.33	21.6	U 21 05 46.7
21.5	61 58 44.8	3 57 40.0	15 37.65	57 21.31 -24.60		L 21 18 14.5
22.0	68 33 19.5	3 32 55.6	15 31.22	56 57.71 23.60	22.6	U 22 06 42.3
22.5	75 02 23.5	3 05 46.6	15 25.13	56 35.33 22.38		L 22 19 09.9
23.0	81 26 22.7	2 36 38.4	15 19.41	56 14.35 20.98	23.6	U 23 07 37.2
23.5	87 45 44.8	+2 05 55.7	15 14.10	55 54.86 19.49		L 23 20 04.0
24.0	94 00 57.5	1 34 02.7	15 09.21	55 36.92 -17.94	24.6	U 24 08 30.2
24.5	100 12 29.1	1 01 22.8	15 04.75	55 20.56 16.36		L 24 20 55.7
25.0	106 20 46.5	+0 28 18.3	15 00.72	55 05.75 14.81	25.6	U 25 09 20.4
25.5	112 26 15.8	-0 04 48.8	14 57.10	54 52.47 13.28		L 25 21 44.3
26.0	118 29 21.3	-0 37 37.7	14 53.90	54 40.71 11.76	26.6	U 26 10 07.5
26.5	124 30 25.6	1 09 48.1	14 51.09	54 30.40 -10.31		L 26 22 30.0
27.0	130 29 49.2	1 41 00.7	14 48.66	54 21.49 8.91	27.6	U 27 10 51.8
27.5	136 27 51.1	2 10 57.0	14 46.60	54 13.93 7.56		L 27 23 13.1
28.0	142 24 48.2	2 39 19.7	14 44.90	54 07.70 6.23	28.6	U 28 11 33.8
28.5	148 20 56.4	-3 05 52.1	14 43.56	54 02.78 4.92		L 28 23 54.2
29.0	154 16 30.1	3 30 18.9	14 42.58	53 59.16 -3.62	0.0	...
29.5	160 11 42.8	3 52 26.2	14 41.95	53 56.86 2.30		U 29 12 14.3
30.0	166 06 47.5	4 12 00.9	14 41.69	53 55.90 -0.96	1.0	L 30 00 34.2
30.5	172 01 57.3	4 28 51.7	14 41.80	53 56.33 +0.43		U 30 12 54.1
31.0	177 57 25.3	-4 42 48.4	14 42.31	53 58.20 1.87	2.0	L 31 01 14.0
31.5	183 53 25.4	4 53 42.4	14 43.23	54 01.58 +3.38		U 31 13 34.1
Sept. 1.0	189 50 12.7	5 01 26.5	14 44.59	54 06.56 4.98	3.0	L 1 01 54.4
1.5	195 48 03.3	5 05 54.8	14 46.41	54 13.22 6.66		U 1 14 15.1
2.0	201 47 15.2	5 07 03.1	14 48.71	54 21.65 8.43	4.0	L 2 02 36.4
2.5	207 48 08.1	-5 04 48.2	14 51.51	54 31.95 10.30		U 2 14 58.2
3.0	213 51 04.0	4 59 08.6	14 54.84	54 44.17 +12.22	5.0	L 3 03 20.7
3.5	219 56 26.5	4 50 03.9	14 58.71	54 58.39 14.22		U 3 15 44.0
4.0	226 04 41.3	4 37 35.4	15 03.14	55 14.64 16.25	6.0	L 4 04 08.1
4.5	232 16 15.9	4 21 45.5	15 08.13	55 32.94 18.30		U 4 16 33.1
5.0	238 31 39.2	-4 02 38.7	15 13.66	55 53.25 20.31	7.0	L 5 04 59.0
5.5	244 51 21.0	3 40 21.3	15 19.72	56 15.48 +22.23		U 5 17 25.8
6.0	251 15 51.4	3 15 01.5	15 26.27	56 39.52 24.04	8.0	L 6 05 53.3
6.5	257 45 40.0	2 46 50.5	15 33.25	57 05.15 25.63		U 6 18 21.5
7.0	264 21 14.7	2 16 02.0	15 40.59	57 32.10 26.95	9.0	L 7 06 50.1
7.5	271 03 00.9	-1 42 53.6	15 48.20	58 00.03 +27.93		U 7 19 19.1
8.0	277 51 19.4	-1 07 46.5	15 55.95	58 28.49 +28.46	10.0	L 8 07 48.1

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
						^{12h} ^{d h m} ^{+ -}
Sept. 8-0	277 51 19.4	-1 07 46.5	15 55.95	58 28.49 +28.47	10-0	L 8 07 48.1 29.0
8-5	284 46 25.6	-0 31 06.2	16 03.71	58 56.96 27.89		U 8 20 17.1 28.8
9-0	291 48 27.1	+0 06 37.3	16 11.31	59 24.85 26.63	11-0	L 9 08 45.9 28.4
9-5	298 57 22.2	0 44 49.3	16 18.57	59 51.48 24.68		U 9 21 14.3 28.0
10-0	306 12 58.5	1 22 51.2	16 25.29	60 16.16 22.00	12-0	L 10 09 42.3 27.6
10-5	313 34 51.3	+2 00 00.6	16 31.28	60 38.16 +18.63		U 10 22 09.9 27.3
11-0	321 02 23.1	2 35 33.1	16 36.36	60 56.79 14.62	13-0	L 11 10 37.2 26.9
11-5	328 34 43.0	3 08 43.1	16 40.34	61 11.41 10.09		U 11 23 04.1 26.7
12-0	336 10 48.2	3 38 46.8	16 43.09	61 21.50 5.17	14-0	L 12 11 30.8 26.6
12-5	343 49 25.3	4 05 03.4	16 44.50	61 26.67 +0.05		U 12 23 57.4 26.6
13-0	351 29 12.6	+4 26 57.7	16 44.51	61 26.72 -5.08	15-0	... ...
13-5	359 08 44.7	4 44 02.2	16 43.13	61 21.64 10.04		L 13 12 24.0 26.7
14-0	6 46 35.6	4 55 57.9	16 40.39	61 11.60 14.60	16-0	U 14 00 50.7 26.9
14-5	14 21 22.9	5 02 35.6	16 36.41	60 57.00 18.67		L 14 13 17.6 27.2
15-0	21 51 51.3	5 03 55.1	16 31.33	60 38.33 22.11	17-0	U 15 01 44.8 27.6
15-5	29 16 56.5	+5 00 05.3	16 25.31	60 16.22 -24.84		L 15 14 12.4 27.9
16-0	36 35 46.5	4 51 22.2	16 18.54	59 51.38 26.86	18-0	U 16 02 40.3 28.3
16-5	43 47 43.0	4 38 07.9	16 11.22	59 24.52 28.14		L 16 15 08.6 28.5
17-0	50 52 21.7	4 20 48.7	16 03.55	58 56.38 28.77	19-0	U 17 03 37.1 28.7
17-5	57 49 31.7	3 59 53.5	15 55.71	58 27.61 28.77		L 17 16 05.8 28.6
18-0	64 39 14.0	+3 35 52.5	15 47.88	57 58.84 -28.24	20-0	U 18 04 34.4 28.5
18-5	71 21 39.8	3 09 16.0	15 40.18	57 30.60 27.24		L 18 17 02.9 28.2
19-0	77 57 09.1	2 40 33.4	15 32.76	57 03.36 25.89	21-0	U 19 05 31.1 27.6
19-5	84 26 08.1	2 10 13.2	15 25.71	56 37.47 24.26		L 19 17 58.7 26.9
20-0	90 49 08.4	1 38 42.0	15 19.10	56 13.21 22.41	22-0	U 20 06 25.6 26.2
20-5	97 06 44.2	+1 06 24.8	15 12.99	55 50.80 -20.40		L 20 18 51.8 25.4
21-0	103 19 32.2	0 33 44.9	15 07.43	55 30.40 18.33	23-0	U 21 07 17.2 24.5
21-5	109 28 09.3	+0 01 04.2	15 02.44	55 12.07 16.21		L 21 19 41.7 23.7
22-0	115 33 12.3	-0 31 16.9	14 58.02	54 55.86 14.10	24-0	U 22 08 05.4 22.9
22-5	121 35 17.0	1 02 59.4	14 54.18	54 41.76 12.03		L 22 20 28.3 22.1
23-0	127 34 57.2	-1 33 45.2	14 50.91	54 29.73 -10.01	25-0	U 23 08 50.4 21.6
23-5	133 32 45.1	2 03 17.2	14 48.18	54 19.72 8.07		L 23 21 12.0 21.0
24-0	139 29 09.7	2 31 19.1	14 45.98	54 11.65 6.23	26-0	U 24 09 33.0 20.6
24-5	145 24 37.7	2 57 35.7	14 44.28	54 05.42 4.49		L 24 21 53.6 20.2
25-0	151 19 33.0	3 21 52.1	14 43.06	54 00.93 2.85	27-0	U 25 10 13.8 20.1
25-5	157 14 16.5	-3 43 54.8	14 42.28	53 58.08 -1.29		L 25 22 33.9 19.9
26-0	163 09 06.8	4 03 31.0	14 41.93	53 56.79 0.17	28-0	U 26 10 53.8 19.9
26-5	169 04 19.7	4 20 28.7	14 41.98	53 56.96 +1.56		L 26 23 13.7 20.1
27-0	175 00 09.1	4 34 37.3	14 42.40	53 58.52 2.89	29-0	U 27 11 33.8 20.2
27-5	180 56 46.6	4 45 47.4	14 43.19	54 01.41 4.17		L 27 23 54.0 20.6
28-0	186 54 22.7	-4 53 50.9	14 44.32	54 05.58 +5.41	0.3	... ...
28-5	192 53 06.8	4 58 41.4	14 45.80	54 10.99 6.66		U 28 12 14.6 21.0
29-0	198 53 07.9	5 00 14.0	14 47.62	54 17.65 7.90	1.3	L 29 00 35.6 21.6
29-5	204 54 34.9	4 58 25.6	14 49.77	54 25.55 9.17		U 29 12 57.2 22.2
30-0	210 57 37.3	4 53 15.1	14 52.27	54 34.72 10.47	2.3	L 30 01 19.4 22.8
30-5	217 02 25.6	-4 44 42.8	14 55.12	54 45.19 +11.80		U 30 13 42.2 23.6
Oct. 1-0	223 09 11.9	-4 32 51.3	14 58.33	54 56.99	3.3	L 1 02 05.8 23.6

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
						<div><div></div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></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Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
						^{12h} d h m +
Oct. 24.0	171° 49' 03".3	-4° 33' 56".3	14' 43".62	54' 02".97 + 2".56	26.3	U 24 09 32.3 ^{20.2} L 24 21 52.5 ^{20.5}
24.5	177 45 21.9	4 45 19.2	14 44.31	54 05.53 4.22	27.3	U 25 10 13.0 ^{20.9} L 25 22 33.9 ^{21.3}
25.0	183 42 56.6	4 53 37.0	14 45.46	54 09.75 5.72	28.3	U 26 10 55.2 ^{22.0} L 26 23 17.2 ^{22.6}
25.5	189 42 03.1	4 58 42.5	14 47.02	54 15.47 7.06	29.3	U 27 11 39.8 ^{23.4} L 27 11 39.8 ^{23.4}
26.0	195 42 54.2	5 00 30.0	14 48.94	54 22.53 8.27	0.6	U 28 12 27.3 ^{24.9} L 28 00 03.2 ^{24.1}
26.5	201 45 40.0	-4 58 55.3	14 51.20	54 30.80 + 9.36	1.6	U 29 13 17.9 ^{25.7} L 29 01 44.3 ^{26.4}
27.0	207 50 28.3	4 53 55.8	14 53.75	54 40.16 + 10.31	2.6	U 30 14 11.3 ^{27.0} L 31 02 38.7 ^{27.6}
27.5	213 57 24.8	4 45 31.5	14 56.56	54 50.47 11.17	3.6	U 31 15 06.3 ^{27.8} L 1 03 34.1 ^{27.7}
28.0	220 06 34.2	4 33 44.1	14 59.60	55 01.64 11.94	4.6	U 1 16 01.8 ^{27.4} L 2 04 29.2 ^{27.1}
28.5	226 18 00.1	4 18 37.7	15 02.85	55 13.58 12.66	5.6	U 2 16 56.3 ^{26.8} L 3 05 23.1 ^{26.3}
29.0	232 31 46.1	-4 00 19.2	15 06.30	55 26.24 + 13.32	6.6	U 3 17 49.4 ^{25.9} L 4 06 15.3 ^{25.6}
29.5	238 47 56.0	3 38 57.6	15 09.93	55 39.56 13.94	7.6	U 4 18 40.9 ^{25.3} L 5 07 06.2 ^{25.1}
30.0	245 06 34.4	3 14 44.7	15 13.73	55 53.50 14.55	8.6	U 5 19 31.3 ^{25.2} L 6 07 56.5 ^{25.2}
30.5	251 27 47.2	2 47 54.5	15 17.69	56 08.05 15.16	9.6	U 6 20 21.7 ^{25.5} L 7 08 47.2 ^{25.8}
31.0	257 51 42.3	2 18 43.6	15 21.82	56 23.21 15.74	10.6	U 7 21 13.0 ^{26.4} L 8 09 39.4 ^{27.0}
31.5	264 18 28.9	-1 47 30.8	15 26.11	56 38.95 + 16.30	11.6	U 8 22 06.4 ^{27.6} L 9 10 34.0 ^{28.3}
Nov. 1.0	270 48 18.3	1 14 37.1	15 30.55	56 55.25 16.85	12.6	U 9 23 02.3 ^{29.0} L 10 11 31.3 ^{29.5}
1.5	277 21 23.4	0 40 25.5	15 35.14	57 12.10 17.36	13.6	U 10 00 00.8 ^{29.9} L 11 12 30.7 ^{30.1}
2.0	283 57 58.5	-0 05 21.2	15 39.87	57 29.46 17.76	14.6	U 11 00 00.8 ^{29.9} L 12 13 30.7 ^{29.6}
2.5	290 38 18.6	+0 30 08.9	15 44.71	57 47.22 18.07	15.6	U 12 01 00.8 ^{29.9} L 13 02 00.3 ^{29.0}
3.0	297 22 38.7	+1 05 36.1	15 49.63	58 05.29 + 18.21	16.6	U 13 14 29.3 ^{28.2} L 14 15 24.7 ^{27.2}
3.5	304 11 12.6	1 40 30.2	15 54.59	58 23.50 18.14	17.6	U 14 02 57.5 ^{26.2} L 15 03 50.9 ^{25.2}
4.0	311 04 12.2	2 14 19.7	15 59.54	58 41.64 17.82	18.6	U 15 03 50.9 ^{25.2} L 16 04 40.2 ^{24.1}
4.5	318 01 45.7	2 46 32.0	16 04.39	58 59.46 17.18	19.6	U 16 04 40.2 ^{24.1} L 17 05 30.7 ^{23.4}
5.0	325 03 56.1	3 16 34.0	16 09.07	59 16.64 16.15	20.6	U 17 05 30.7 ^{23.4} L 18 06 20.2 ^{22.7}
5.5	332 10 40.6	+3 43 52.8	16 13.47	59 32.79 + 14.75	21.6	U 18 06 20.2 ^{22.7} L 19 07 10.7 ^{22.0}
6.0	339 21 48.3	4 07 56.2	16 17.49	59 47.54 12.90	22.6	U 19 07 10.7 ^{22.0} L 20 08 01.2 ^{21.3}
6.5	346 36 59.8	4 28 14.1	16 21.01	60 00.44 10.62	23.6	U 20 08 01.2 ^{21.3} L 21 08 51.7 ^{20.6}
7.0	353 55 46.1	4 44 19.4	16 23.90	60 11.06 7.92	24.6	U 21 08 51.7 ^{20.6} L 22 09 42.2 ^{19.9}
7.5	1 17 29.1	4 55 49.1	16 26.06	60 18.98 4.82	25.6	U 22 09 42.2 ^{19.9} L 23 10 32.7 ^{19.2}
8.0	8 41 21.5	+5 02 26.0	16 27.37	60 23.80 + 1.45	26.6	U 23 10 32.7 ^{19.2} L 24 11 23.2 ^{18.5}
8.5	16 06 28.1	5 03 59.2	16 27.77	60 25.25 - 2.17	27.6	U 24 11 23.2 ^{18.5} L 25 12 13.7 ^{17.8}
9.0	23 31 47.9	5 00 25.4	16 27.18	60 23.08 5.88	28.6	U 25 12 13.7 ^{17.8} L 26 13 04.2 ^{17.1}
9.5	30 56 16.5	4 51 48.9	16 25.57	60 17.20 9.58	29.6	U 26 13 04.2 ^{17.1} L 27 13 54.7 ^{16.4}
10.0	38 18 48.5	4 38 21.9	16 22.96	60 07.62 13.13	30.6	U 27 13 54.7 ^{16.4} L 28 14 45.2 ^{15.7}
10.5	45 38 20.8	+4 20 23.8	16 19.38	59 54.49 - 16.42	31.6	U 28 14 45.2 ^{15.7} L 29 15 35.7 ^{15.0}
11.0	52 53 55.0	3 58 20.3	16 14.91	59 38.07 19.30	32.6	U 29 15 35.7 ^{15.0} L 30 16 26.2 ^{14.3}
11.5	60 04 40.2	3 32 41.7	16 09.65	59 18.77 21.72	33.6	U 30 16 26.2 ^{14.3} L 31 17 16.7 ^{13.6}
12.0	67 09 54.0	3 04 02.0	16 03.73	58 57.05 23.63	34.6	U 31 17 16.7 ^{13.6} L 1 18 07.2 ^{12.9}
12.5	74 09 05.0	2 32 57.0	15 57.30	58 33.42 24.94	35.6	U 1 18 07.2 ^{12.9} L 2 18 57.7 ^{12.2}
13.0	81 01 51.7	+2 00 02.7	15 50.50	58 08.48 - 25.70	36.6	U 2 18 57.7 ^{12.2} L 3 19 48.2 ^{11.5}
13.5	87 48 03.5	1 25 54.3	15 43.50	57 42.78 25.89	37.6	U 3 19 48.2 ^{11.5} L 4 20 38.7 ^{10.8}
14.0	94 27 39.8	0 51 05.2	15 36.45	57 16.89 25.55	38.6	U 4 20 38.7 ^{10.8} L 5 21 29.2 ^{10.1}
14.5	101 00 49.0	+0 16 06.2	15 29.49	56 51.34 24.72	39.6	U 5 21 29.2 ^{10.1} L 6 22 19.7 ^{9.4}
15.0	107 27 47.4	-0 18 34.6	15 22.75	56 26.62 23.47	40.6	U 6 22 19.7 ^{9.4} L 7 23 10.2 ^{8.7}
15.5	113 48 57.9	-0 52 32.2	15 16.36	56 03.15 - 21.85	41.6	U 7 23 10.2 ^{8.7} L 8 24 00.7 ^{8.0}
16.0	120 04 49.1	-1 25 24.5	15 10.40	55 41.30	42.6	U 8 24 00.7 ^{8.0} L 9 24 51.2 ^{7.3}

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
<div> <div>12^h</div> <div> <div>d</div> <div>h</div> <div>m</div> <div>s</div> <div>+</div> <div>-</div> </div> </div>						
Nov. 16-0	120 04 49.1	-1 25 24.5	15 10.40	55 41.30	19-6	U 16 04 40.2
16-5	126 15 53.5	1 56 52.2	15 04.97	55 21.37	19-93	L 16 17 03.4
17-0	132 22 46.8	2 26 38.4	15 00.14	55 03.62	17-75	U 17 05 25.8
17-5	138 26 06.9	2 54 28.2	14 55.95	54 48.24	15.38	L 17 17 47.4
18-0	144 26 32.4	3 20 08.5	14 52.44	54 35.36	12.88	U 18 06 08.4
18-5	150 24 42.9	-3 43 27.8	14 49.63	54 25.05	10.31	L 18 18 29.0
19-0	156 21 17.3	4 04 15.4	14 47.54	54 17.36	7.69	U 19 06 49.2
19-5	162 16 53.7	4 22 21.7	14 46.15	54 12.29	5.07	L 19 19 09.2
20-0	168 12 08.9	4 37 38.0	14 45.47	54 09.79	2.50	U 20 07 29.2
20-5	174 07 37.8	4 49 56.0	14 45.47	54 09.79	0.00	L 20 19 49.2
21-0	180 03 52.7	-4 59 08.3	14 46.12	54 12.18	+2.39	U 21 08 09.4
21-5	186 01 23.6	5 05 08.2	14 47.38	54 16.81	+4.63	L 21 20 29.9
22-0	192 00 37.4	5 07 49.6	14 49.21	54 23.52	6.71	U 22 08 50.9
22-5	198 01 57.8	5 07 07.7	14 51.56	54 32.13	8.61	L 22 21 12.5
23-0	204 05 44.9	5 02 58.8	14 54.37	54 42.43	10.30	U 23 09 34.7
23-5	210 12 15.4	-4 55 21.1	14 57.57	54 54.19	11.76	L 23 21 57.6
24-0	216 21 42.6	4 44 14.2	15 01.11	55 07.19	+13.00	U 24 10 21.4
24-5	222 34 15.9	4 29 40.2	15 04.92	55 21.19	14.00	L 24 22 46.0
25-0	228 50 01.5	4 11 43.8	15 08.94	55 35.93	14.74	U 25 11 11.5
25-5	235 09 02.7	3 50 32.3	15 13.10	55 51.20	15.27	L 25 23 37.8
26-0	241 31 19.9	-3 26 16.3	15 17.34	56 06.76	15.56	...
26-5	247 56 51.3	2 59 09.3	15 21.60	56 22.41	+15.65	U 26 12 04.8
27-0	254 25 33.4	2 29 28.3	15 25.84	56 37.97	15.56	L 27 00 32.4
27-5	260 57 21.3	1 57 33.3	15 30.01	56 53.27	15.30	U 27 13 00.4
28-0	267 32 09.7	1 23 47.3	15 34.07	57 08.18	14.91	L 28 01 28.6
28-5	274 09 53.1	-0 48 35.9	15 38.00	57 22.60	14.42	U 28 13 56.8
29-0	280 50 26.1	-0 12 27.2	15 41.78	57 36.46	+13.86	L 29 02 24.8
29-5	287 33 44.2	+0 24 08.8	15 45.39	57 49.72	13.26	U 29 14 52.5
30-0	294 19 43.4	1 00 41.0	15 48.83	58 02.35	12.63	L 30 03 19.7
30-5	301 08 20.6	1 36 37.0	15 52.10	58 14.33	11.98	U 30 15 46.4
Dec. 1-0	307 59 33.4	+2 11 24.4	15 55.18	58 25.65	11.32	L 1 04 12.4
1-5	314 53 19.6	2 44 30.8	15 58.09	58 36.32	+10.67	U 1 16 37.9
2-0	321 49 36.7	3 15 24.6	16 00.81	58 46.30	9.98	L 2 05 03.0
2-5	328 48 21.5	3 43 35.4	16 03.32	58 55.54	9.24	U 2 17 27.8
3-0	335 49 29.2	4 08 34.8	16 05.63	59 03.99	8.45	L 3 05 52.4
3-5	342 52 52.7	+4 29 56.3	16 07.68	59 11.54	7.55	U 3 18 16.8
4-0	349 58 21.8	4 47 16.9	16 09.46	59 18.06	+6.52	L 4 06 41.3
4-5	357 05 42.9	5 00 16.8	16 10.92	59 23.41	5.35	U 4 19 06.0
5-0	4 14 37.8	5 08 40.3	16 12.00	59 27.39	3.98	L 5 07 31.1
5-5	11 24 44.1	5 12 16.7	16 12.66	59 29.82	2.43	U 5 19 56.7
6-0	18 35 34.8	+5 11 00.3	16 12.85	59 30.49	+0.67	L 6 08 22.9
6-5	25 46 38.8	5 04 51.3	16 12.50	59 29.22	1.27	U 6 20 49.7
7-0	32 57 21.6	4 53 55.4	16 11.58	59 25.84	3.38	L 7 09 17.2
7-5	40 07 05.9	4 38 24.7	16 10.05	59 20.21	5.63	U 7 21 45.5
8-0	47 15 12.8	4 18 36.9	16 07.88	59 12.27	7.94	L 8 10 14.4
8-5	54 21 03.6	+3 54 54.8	16 05.08	59 02.00	10.27	U 8 22 43.8
9-0	61 24 00.6	+3 27 45.8	16 01.67	58 49.46	-12.54	L 9 11 13.5

Date	Longitude	Latitude	Semi-diameter	Horizontal Parallax	Age	Transit, Meridian of Greenwich
						^{12h} ^d ^h ^m ⁺ ⁺
Dec. 9-0	61° 24' 00.6	+3° 27' 45.8	16' 01.67	58' 49.46 -14.67	12-9	L 9 11 13.5 U 9 23 43.2
9-5	68 23 28.8	2 57 40.8	15 57.67	58 34.79 16.59	13-9	...
10-0	75 18 57.1	2 25 13.3	15 53.15	58 18.20 18.24	14-9	L 10 12 12.7 U 11 00 41.8
10-5	82 09 59.1	1 50 58.1	15 48.18	57 59.96 19.57	15-9	L 11 13 10.2 U 12 01 37.7
11-0	88 56 14.6	1 15 30.0	15 42.85	57 40.39 20.52	16-9	L 12 14 04.2 U 13 02 29.7
11-5	95 37 29.0	+0 39 23.4	15 37.26	57 19.87 21.07	17-9	L 13 14 54.2 U 14 03 17.7
12-0	102 13 34.7	+0 03 10.6	15 31.52	56 58.80 21.21	18-9	L 14 15 40.3 U 15 04 02.2
12-5	108 44 30.2	-0 32 38.0	15 25.74	56 37.59 20.95	19-9	L 15 16 23.5 U 16 04 44.2
13-0	115 10 20.4	1 07 35.1	15 20.03	56 16.64 20.29	20-9	L 16 17 04.5 U 17 05 24.6
13-5	121 31 15.7	1 41 16.1	15 14.51	55 56.35 19.24	21-9	L 17 17 44.7 U 18 06 04.7
14-0	127 47 32.3	-2 13 19.6	15 09.26	55 37.11 17.87	22-9	L 18 18 24.9 U 19 06 45.4
14-5	133 59 30.9	2 43 27.0	15 04.39	55 19.24 16.18	23-9	L 19 19 06.3 U 20 07 27.8
15-0	140 07 36.1	3 11 22.4	14 59.99	55 03.06 14.23	24-9	L 20 19 50.0 U 21 08 12.9
15-5	146 12 16.2	3 36 52.4	14 56.11	54 48.83 12.05	25-9	L 21 20 36.7 U 22 09 01.4
16-0	152 14 02.2	3 59 45.4	14 52.83	54 36.78 9.69	26-9	L 22 21 27.0 U 23 09 53.5
16-5	158 13 27.4	-4 19 51.9	14 50.19	54 27.09 7.20	27-9	L 23 22 20.8 U 24 10 48.8
17-0	164 11 06.7	4 37 03.5	14 48.22	54 19.89 4.59	28-9	L 24 23 17.3 U 25 11 46.0
17-5	170 07 36.1	4 51 13.3	14 46.97	54 15.30 1.93	0-3	...
18-0	176 03 32.0	5 02 14.9	14 46.45	54 13.37 0.74	1-3	L 26 00 14.8 U 26 12 43.5
18-5	181 59 31.1	5 10 03.1	14 46.65	54 14.11 3.40	2-3	L 27 01 11.8 U 27 13 39.5
19-0	187 56 09.5	-5 14 33.1	14 47.58	54 17.51 5.99	3-3	L 28 02 06.7 U 28 14 33.3
19-5	193 54 02.5	5 15 41.0	14 49.21	54 23.50 8.48	4-3	L 29 02 59.3 U 29 15 24.8
20-0	199 53 44.0	5 13 23.2	14 51.52	54 31.98 10.84	5-3	L 30 03 49.9 U 30 16 14.7
20-5	205 55 45.9	5 07 37.6	14 54.47	54 42.82 13.01	6-3	L 31 04 39.3 U 31 17 03.8
21-0	212 00 38.0	4 58 22.7	14 58.01	54 55.83 14.96	7-3	L 32 05 28.5
21-5	218 08 46.9	-4 45 38.6	15 02.09	55 10.79 16.65		
22-0	224 20 36.1	4 29 27.3	15 06.63	55 27.44 18.07		
22-5	230 36 25.4	4 09 52.8	15 11.55	55 45.51 19.12		
23-0	236 56 30.3	3 47 01.6	15 16.76	56 04.63 19.86		
23-5	243 21 02.1	3 21 03.5	15 22.17	56 24.49 20.20		
24-0	249 50 07.0	-2 52 11.6	15 27.68	56 44.69 20.18		
24-5	256 23 46.5	2 20 42.6	15 33.17	57 04.87 19.76		
25-0	263 01 57.3	1 46 57.3	15 38.56	57 24.63 18.98		
25-5	269 44 31.4	1 11 20.4	15 43.73	57 43.61 17.86		
26-0	276 31 16.1	-0 34 20.1	15 48.59	58 01.47 16.44		
26-5	283 21 54.7	+0 03 31.8	15 53.07	58 17.91 14.79		
27-0	290 16 07.1	0 41 40.8	15 57.10	58 32.70 12.91		
27-5	297 13 30.2	1 19 30.7	16 00.62	58 45.61 10.94		
28-0	304 13 39.2	1 56 24.2	16 03.60	58 56.55 8.89		
28-5	311 16 07.5	2 31 43.7	16 06.02	59 05.44 6.86		
29-0	318 20 28.3	+3 04 53.2	16 07.89	59 12.30 4.88		
29-5	325 26 14.5	3 35 18.5	16 09.22	59 17.18 3.00		
30-0	332 33 00.2	4 02 28.4	16 10.04	59 20.18 1.25		
30-5	339 40 20.3	4 25 55.7	16 10.38	59 21.43 0.34		
31-0	346 47 51.3	4 45 17.0	16 10.29	59 21.09 1.79		
31-5	353 55 11.8	+5 00 14.1	16 09.80	59 19.30 3.07		
32-0	1 02 01.7	+5 10 33.6	16 08.96	59 16.23		

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Tuesday, January 1			Thursday, January 3		
0	^{h m} 14 38 59.82 ^s 136.66	[°] -20 53 32.5 ['] -572.3	0	^{h m} 16 37 14.25 ^s 158.16	[°] -26 08 45.3 ['] -169.8
1	14 41 16.48 137.14	21 03 04.8 566.3	1	16 39 52.41 158.49	26 11 35.1 159.2
2	14 43 33.62 137.63	21 12 31.1 560.1	2	16 42 30.90 158.80	26 14 14.3 148.4
3	14 45 51.25 138.12	21 21 51.2 553.9	3	16 45 09.70 159.11	26 16 42.7 137.7
4	14 48 09.37 138.61	21 31 05.1 547.5	4	16 47 48.81 159.40	26 19 00.4 126.8
5	14 50 27.98 139.10	21 40 12.6 541.1	5	16 50 28.21 159.69	26 21 07.2 115.9
6	14 52 47.08 139.59	21 49 13.7 534.6	6	16 53 07.90 159.97	26 23 03.1 105.0
7	14 55 06.67 140.08	21 58 08.3 527.9	7	16 55 47.87 160.24	26 24 48.1 94.0
8	14 57 26.75 140.57	22 06 56.2 521.1	8	16 58 28.11 160.50	26 26 22.1 82.8
9	14 59 47.32 141.07	22 15 37.3 514.3	9	17 01 08.61 160.75	26 27 44.9 71.8
10	15 02 08.39 141.56	22 24 11.6 507.4	10	17 03 49.36 161.00	26 28 56.7 60.5
11	15 04 29.95 142.05	22 32 39.0 500.3	11	17 06 30.36 161.22	26 29 57.2 49.3
12	15 06 52.00 142.54	22 40 59.3 493.2	12	17 09 11.58 161.44	26 30 46.5 38.0
13	15 09 14.54 143.03	22 49 12.5 485.9	13	17 11 53.02 161.65	26 31 24.5 26.6
14	15 11 37.57 143.53	22 57 18.4 478.6	14	17 14 34.67 161.85	26 31 51.1 15.2
15	15 14 01.10 144.01	23 05 17.0 471.1	15	17 17 16.52 162.04	26 32 06.3 3.8
16	15 16 25.11 144.50	23 13 08.1 463.5	16	17 19 58.56 162.22	26 32 10.1 + 7.7
17	15 18 49.61 144.98	23 20 51.6 455.9	17	17 22 40.78 162.38	26 32 02.4 19.1
18	15 21 14.59 145.47	23 28 27.5 448.1	18	17 25 23.16 162.54	26 31 43.3 30.7
19	15 23 40.06 145.95	23 35 55.6 440.2	19	17 28 05.70 162.68	26 31 12.6 42.3
20	15 26 06.01 146.43	23 43 15.8 432.2	20	17 30 48.38 162.82	26 30 30.3 53.9
21	15 28 32.44 146.91	23 50 28.0 424.2	21	17 33 31.20 162.93	26 29 36.4 65.5
22	15 30 59.35 147.39	23 57 32.2 416.1	22	17 36 14.13 163.05	26 28 30.9 77.2
23	15 33 26.74 147.86	-24 04 28.3 -407.7	23	17 38 57.18 163.15	-26 27 13.7 + 88.8
Wednesday, January 2			Friday, January 4		
0	15 35 54.60 148.33	-24 11 16.0 -399.4	0	17 41 40.33 163.24	-26 25 44.9 +100.5
1	15 38 22.93 148.80	24 17 55.4 390.9	1	17 44 23.57 163.31	26 24 04.4 112.2
2	15 40 51.73 149.26	24 24 26.3 382.3	2	17 47 06.88 163.38	26 22 12.2 124.0
3	15 43 20.99 149.72	24 30 48.6 373.6	3	17 49 50.26 163.43	26 20 08.2 135.6
4	15 45 50.71 150.18	24 37 02.2 364.9	4	17 52 33.69 163.47	26 17 52.6 147.4
5	15 48 20.89 150.63	24 43 07.1 356.0	5	17 55 17.16 163.51	26 15 25.2 159.1
6	15 50 51.52 151.07	24 49 03.1 347.0	6	17 58 00.67 163.53	26 12 46.1 170.7
7	15 53 22.59 151.52	24 54 50.1 337.9	7	18 00 44.20 163.54	26 09 55.4 182.5
8	15 55 54.11 151.96	25 00 28.0 328.7	8	18 03 27.74 163.53	26 06 52.9 194.2
9	15 58 26.07 152.39	25 05 56.7 319.5	9	18 06 11.27 163.52	26 03 38.7 205.9
10	16 00 58.46 152.82	25 11 16.2 310.2	10	18 08 54.79 163.50	26 00 12.8 217.5
11	16 03 31.28 153.25	25 16 26.4 300.7	11	18 11 38.29 163.46	25 56 35.3 229.3
12	16 06 04.53 153.66	25 21 27.1 291.1	12	18 14 21.75 163.41	25 52 46.0 240.9
13	16 08 38.19 154.08	25 26 18.2 281.5	13	18 17 05.16 163.36	25 48 45.1 252.5
14	16 11 12.27 154.49	25 30 59.7 271.8	14	18 19 48.52 163.28	25 44 32.6 264.1
15	16 13 46.76 154.88	25 35 31.5 261.9	15	18 22 31.80 163.21	25 40 08.5 275.7
16	16 16 21.64 155.28	25 39 53.4 252.1	16	18 25 15.01 163.12	25 35 32.8 287.2
17	16 18 56.92 155.66	25 44 05.5 242.0	17	18 27 58.13 163.01	25 30 45.6 298.7
18	16 21 32.58 156.04	25 48 07.5 232.0	18	18 30 41.14 162.90	25 25 46.9 310.2
19	16 24 08.62 156.41	25 51 59.5 221.8	19	18 33 24.04 162.79	25 20 36.7 321.6
20	16 26 45.03 156.77	25 55 41.3 211.6	20	18 36 06.83 162.65	25 15 15.1 332.9
21	16 29 21.80 157.14	25 59 12.9 201.2	21	18 38 49.48 162.50	25 09 42.2 344.3
22	16 31 58.94 157.48	26 02 34.1 190.8	22	18 41 31.98 162.36	25 03 57.9 355.6
23	16 34 36.42 157.83	26 05 44.9 -180.4	23	18 44 14.34 162.19	24 58 02.3 +366.8
24	16 37 14.25 158.16	-26 08 45.3	24	18 46 56.53 162.00	-24 51 55.5

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination			
Saturday, January 5							Monday, January 7							
0	^h 18 46	^m 56	^s 53	[°] 162-02	['] -24 51	[″] 55.5	+378.0	0	^h 20 51	^m 09	^s 83	[°] -16 45	['] 05.2	[″] +807.8
1	18 49	38	55	161-84	24 45	37.5	389.1	1	20 53	36	39	16 31	37.4	814.0
2	18 52	20	39	161-65	24 39	08.4	400.2	2	20 56	02	57	16 18	03.4	819.9
3	18 55	02	04	161-45	24 32	28.2	411.1	3	20 58	28	37	16 04	23.5	825.9
4	18 57	43	49	161-24	24 25	37.1	422.1	4	21 00	53	79	15 50	37.6	831.6
5	19 00	24	73	161-02	24 18	35.0	433.0	5	21 03	18	83	15 36	46.0	837.3
6	19 03	05	75	160-80	24 11	22.0	443.7	6	21 05	43	49	15 22	48.7	842.8
7	19 05	46	55	160-56	24 03	58.3	454.4	7	21 08	07	77	15 08	45.9	848.2
8	19 08	27	11	160-33	23 56	23.9	465.1	8	21 10	31	68	14 54	37.7	853.4
9	19 11	07	44	160-07	23 48	38.8	475.6	9	21 12	55	21	14 40	24.3	858.7
10	19 13	47	51	159-82	23 40	43.2	486.1	10	21 15	18	38	14 26	05.6	863.6
11	19 16	27	33	159-55	23 32	37.1	496.5	11	21 17	41	17	14 11	42.0	868.5
12	19 19	06	88	159-28	23 24	20.6	506.8	12	21 20	03	59	13 57	13.5	873.3
13	19 21	46	16	159-00	23 15	53.8	517.1	13	21 22	25	65	13 42	40.2	877.9
14	19 24	25	16	158-71	23 07	16.7	527.2	14	21 24	47	35	13 28	02.3	882.5
15	19 27	03	87	158-42	22 58	29.5	537.3	15	21 27	08	69	13 13	19.8	886.8
16	19 29	42	29	158-12	22 49	32.2	547.2	16	21 29	29	67	12 58	33.0	891.1
17	19 32	20	41	157-82	22 40	25.0	557.0	17	21 31	50	30	12 43	41.9	895.3
18	19 34	58	23	157-50	22 31	08.0	566.8	18	21 34	10	57	12 28	46.6	899.2
19	19 37	35	73	157-19	22 21	41.2	576.5	19	21 36	30	50	12 13	47.4	903.2
20	19 40	12	92	156-87	22 12	04.7	586.0	20	21 38	50	08	11 58	44.2	907.0
21	19 42	49	79	156-54	22 02	18.7	595.5	21	21 41	09	33	11 43	37.2	910.6
22	19 45	26	33	156-20	21 52	23.2	604.9	22	21 43	28	23	11 28	26.6	914.2
23	19 48	02	53	155-87	-21 42	18.3	+614.2	23	21 45	46	80	-11 13	12.4	+917.6
Sunday, January 6							Tuesday, January 8							
0	19 50	38	40	155-53	-21 32	04.1	+623.3	0	21 48	05	04	-10 57	54.8	+920.9
1	19 53	13	93	155-18	21 21	40.8	632.3	1	21 50	22	95	10 42	33.9	924.0
2	19 55	49	11	154-83	21 11	08.5	641.2	2	21 52	40	54	10 27	09.9	927.1
3	19 58	23	94	154-48	21 00	27.3	650.1	3	21 54	57	81	10 11	42.8	930.1
4	20 00	58	42	154-13	20 49	37.2	658.7	4	21 57	14	76	9 56	12.7	932.8
5	20 03	32	55	153-76	20 38	38.5	667.4	5	21 59	31	40	9 40	39.9	935.6
6	20 06	06	31	153-40	20 27	31.1	675.8	6	22 01	47	73	9 25	04.3	938.2
7	20 08	39	71	153-03	20 16	15.3	684.1	7	22 04	03	76	9 09	26.1	940.7
8	20 11	12	74	152-66	20 04	51.2	692.4	8	22 06	19	49	8 53	45.4	943.0
9	20 13	45	40	152-29	19 53	18.8	700.6	9	22 08	34	93	8 38	02.4	945.3
10	20 16	17	69	151-92	19 41	38.2	708.5	10	22 10	50	07	8 22	17.1	947.4
11	20 18	49	61	151-53	19 29	49.7	716.5	11	22 13	04	93	8 06	29.7	949.4
12	20 21	21	14	151-16	19 17	53.2	724.2	12	22 15	19	50	7 50	40.3	951.4
13	20 23	52	30	150-78	19 05	49.0	731.9	13	22 17	33	80	7 34	48.9	953.1
14	20 26	23	08	150-40	18 53	37.1	739.4	14	22 19	47	82	7 18	55.8	954.9
15	20 28	53	48	150-02	18 41	17.7	746.7	15	22 22	01	57	7 03	00.9	956.4
16	20 31	23	50	149-63	18 28	51.0	754.1	16	22 24	15	06	6 47	04.5	957.9
17	20 33	53	13	149-25	18 16	16.9	761.2	17	22 26	28	29	6 31	06.6	959.3
18	20 36	22	38	148-87	18 03	35.7	768.3	18	22 28	41	27	6 15	07.3	960.6
19	20 38	51	25	148-49	17 50	47.4	775.1	19	22 30	53	99	5 59	06.7	961.7
20	20 41	19	74	148-10	17 37	52.3	781.9	20	22 33	06	47	5 43	05.0	962.7
21	20 43	47	84	147-72	17 24	50.4	788.6	21	22 35	18	71	5 27	02.3	963.7
22	20 46	15	56	147-33	17 11	41.8	795.1	22	22 37	30	71	5 10	58.6	964.5
23	20 48	42	89	146-94	16 58	26.7	+801.5	23	22 39	42	49	4 54	54.1	+965.3
24	20 51	09	83		-16 45	05.2		24	22 41	54	03	-4 38	48.8	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination			
Wednesday, January 9							Friday, January 11							
0	^h 22	^m 41	^s 54.03	[°] 131.32	—	4 38 48.8	0	^h 0	^m 24	^s 19.92	[°] 126.52	+	7 57 31.4	
1	22 44	05.35			4 22 42.9	+965.9	1	0 26	26.44			8 12 22.7	+891.3	
2	22 46	16.46			4 06 36.4	966.5	2	0 28	32.98			8 27 10.6	887.9	
3	22 48	27.36			3 50 29.5	966.9	3	0 30	39.53			8 41 54.9	884.3	
4	22 50	38.05			3 34 22.3	967.2	4	0 32	46.11			8 56 35.6	880.7	
5	22 52	48.54			3 18 14.9	967.4	5	0 34	52.72			9 11 12.7	877.1	
6	22 54	58.84			3 02 07.3	967.6	6	0 36	59.35			9 25 46.0	873.3	
7	22 57	08.94			2 45 59.7	967.6	7	0 39	06.02			9 40 15.5	869.5	
8	22 59	18.86			2 29 52.1	967.4	8	0 41	12.74			9 54 41.1	865.6	
9	23 01	28.60			2 13 44.7	967.2	9	0 43	19.49			10 09 02.8	861.7	
10	23 03	38.15			1 57 37.5	966.9	10	0 45	26.29			10 23 20.5	857.7	
11	23 05	47.54			1 41 30.6	966.4	11	0 47	33.14			10 37 34.1	853.6	
12	23 07	56.76			1 25 24.2	965.9	12	0 49	40.05			10 51 43.6	849.5	
13	23 10	05.82			1 09 18.3	965.3	13	0 51	47.02			11 05 48.9	845.3	
14	23 12	14.72			0 53 13.0	964.5	14	0 53	54.04			11 19 49.9	841.0	
15	23 14	23.48			0 37 08.5	963.8	15	0 56	01.14			11 33 46.7	836.8	
16	23 16	32.08			0 21 04.7	962.9	16	0 58	08.30			11 47 39.0	832.3	
17	23 18	40.55			0 05 01.8	961.9	17	1 00	15.53			12 01 26.8	827.8	
18	23 20	48.88			0 11 00.1	960.8	18	1 02	22.84			12 15 10.2	823.4	
19	23 22	57.08			0 27 00.9	959.7	19	1 04	30.24			12 28 48.9	818.7	
20	23 25	05.16			0 43 00.6	958.4	20	1 06	37.71			12 42 23.1	814.2	
21	23 27	13.11			0 58 59.0	957.2	21	1 08	45.27			12 55 52.5	809.4	
22	23 29	20.95			1 14 56.2	955.7	22	1 10	52.92			13 09 17.2	804.7	
23	23 31	28.67			1 30 51.9	+954.2	23	1 13	00.66			13 22 37.1	799.9	
													+795.0	
Thursday, January 10							Saturday, January 12							
0	23 33	36.29			1 46 46.1	+952.6	0	1 15	08.50			13 35 52.1	+790.1	
1	23 35	43.81			2 02 38.7	951.0	1	1 17	16.44			13 49 02.2	785.0	
2	23 37	51.23			2 18 29.7	949.3	2	1 19	24.47			14 02 07.2	780.0	
3	23 39	58.56			2 34 19.0	947.4	3	1 21	32.62			14 15 07.2	774.9	
4	23 42	05.81			2 50 06.4	945.5	4	1 23	40.87			14 28 02.1	769.7	
5	23 44	12.97			3 05 51.9	943.5	5	1 25	49.23			14 40 51.8	764.4	
6	23 46	20.06			3 21 35.4	941.5	6	1 27	57.70			14 53 36.2	759.2	
7	23 48	27.07			3 37 16.9	939.3	7	1 30	06.29			15 06 15.4	753.9	
8	23 50	34.02			3 52 56.2	937.1	8	1 32	15.00			15 18 49.3	748.4	
9	23 52	40.91			4 08 33.3	934.8	9	1 34	23.82			15 31 17.7	743.0	
10	23 54	47.73			4 24 08.1	932.5	10	1 36	32.77			15 43 40.7	737.4	
11	23 56	54.51			4 39 40.6	929.9	11	1 38	41.85			15 55 58.1	731.9	
12	23 59	01.24			4 55 10.5	927.4	12	1 40	51.05			16 08 10.0	726.3	
13	0 01	07.93			5 10 37.9	924.0	13	1 43	00.38			16 20 16.3	720.6	
14	0 03	14.57			5 26 02.8	922.1	14	1 45	09.85			16 32 16.9	714.8	
15	0 05	21.19			5 41 24.9	919.4	15	1 47	19.45			16 44 11.7	709.0	
16	0 07	27.77			5 56 44.3	916.5	16	1 49	29.18			16 56 00.7	703.2	
17	0 09	34.33			6 12 00.8	913.7	17	1 51	39.05			17 07 43.9	697.3	
18	0 11	40.87			6 27 14.5	910.6	18	1 53	49.06			17 19 21.2	691.3	
19	0 13	47.39			6 42 25.1	907.7	19	1 55	59.20			17 30 52.5	685.3	
20	0 15	53.90			6 57 32.8	904.5	20	1 58	09.49			17 42 17.8	679.3	
21	0 18	00.41			7 12 37.3	901.3	21	2 00	19.93			17 53 37.1	673.2	
22	0 20	06.91			7 27 38.6	898.1	22	2 02	30.51			18 04 50.3	666.9	
23	0 22	13.41			7.42 36.7		23	2 04	41.23			18 15 57.2	+660.8	
24	0 24	19.92			+	7 57 31.4		24	2 06	52.11				

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Sunday, January 13			Tuesday, January 15		
0	^{h m s} 2 06 52.11 ^s 131.02	+18° 26' 58.0" +654.5"	0	^{h m s} 3 54 28.37 ^s 137.63	+24° 58' 42.4" +302.6"
1	2 09 03.13 ^s 131.18	18 37 52.5 648.2	1	3 56 46.00 ^s 137.71	25 03 45.0 294.4
2	2 11 14.31 ^s 131.32	18 48 40.7 641.8	2	3 59 03.71 ^s 137.80	25 08 39.4 286.2
3	2 13 25.63 ^s 131.48	18 59 22.5 635.4	3	4 01 21.51 ^s 137.88	25 13 25.6 278.0
4	2 15 37.11 ^s 131.63	19 09 57.9 629.0	4	4 03 39.39 ^s 137.95	25 18 03.6 269.8
5	2 17 48.74 ^s 131.78	19 20 26.9 622.4	5	4 05 57.34 ^s 138.02	25 22 33.4 261.6
6	2 20 00.52 ^s 131.94	19 30 49.3 615.8	6	4 08 15.36 ^s 138.09	25 26 55.0 253.4
7	2 22 12.46 ^s 132.09	19 41 05.1 609.3	7	4 10 33.45 ^s 138.15	25 31 08.4 245.1
8	2 24 24.55 ^s 132.24	19 51 14.4 602.6	8	4 12 51.60 ^s 138.21	25 35 13.5 236.8
9	2 26 36.79 ^s 132.40	20 01 17.0 595.8	9	4 15 09.81 ^s 138.26	25 39 10.3 228.5
10	2 28 49.19 ^s 132.56	20 11 12.8 589.1	10	4 17 28.07 ^s 138.32	25 42 58.8 220.2
11	2 31 01.75 ^s 132.71	20 21 01.9 582.3	11	4 19 46.39 ^s 138.36	25 46 39.0 211.8
12	2 33 14.46 ^s 132.87	20 30 44.2 575.5	12	4 22 04.75 ^s 138.41	25 50 10.8 203.5
13	2 35 27.33 ^s 133.02	20 40 19.7 568.5	13	4 24 23.16 ^s 138.44	25 53 34.3 195.2
14	2 37 40.35 ^s 133.18	20 49 48.2 561.6	14	4 26 41.60 ^s 138.47	25 56 49.5 186.8
15	2 39 53.53 ^s 133.33	20 59 09.8 554.6	15	4 29 00.07 ^s 138.51	25 59 56.3 178.4
16	2 42 06.86 ^s 133.49	21 08 24.4 547.6	16	4 31 18.58 ^s 138.53	26 02 54.7 170.1
17	2 44 20.35 ^s 133.64	21 17 32.0 540.5	17	4 33 37.11 ^s 138.54	26 05 44.8 161.7
18	2 46 33.99 ^s 133.80	21 26 32.5 533.4	18	4 35 55.65 ^s 138.56	26 08 26.5 153.3
19	2 48 47.79 ^s 133.95	21 35 25.9 526.2	19	4 38 14.21 ^s 138.58	26 10 59.8 144.9
20	2 51 01.74 ^s 134.10	21 44 12.1 519.0	20	4 40 32.79 ^s 138.57	26 13 24.7 136.5
21	2 53 15.84 ^s 134.25	21 52 51.1 511.8	21	4 42 51.36 ^s 138.58	26 15 41.2 128.2
22	2 55 30.09 ^s 134.40	22 01 22.9 504.5	22	4 45 09.94 ^s 138.58	26 17 49.4 119.7
23	2 57 44.49 ^s 134.55	+22 09 47.4 +497.1	23	4 47 28.52 ^s 138.56	+26 19 49.1 +111.3
Monday, January 14			Wednesday, January 16		
0	2 59 59.04 ^s 134.70	+22 18 04.5 +489.8	0	4 49 47.08 ^s 138.55	+26 21 40.4 +102.9
1	3 02 13.74 ^s 134.85	22 26 14.3 482.4	1	4 52 05.63 ^s 138.53	26 23 23.3 94.5
2	3 04 28.59 ^s 134.99	22 34 16.7 474.9	2	4 54 24.16 ^s 138.51	26 24 57.8 86.1
3	3 06 43.58 ^s 135.13	22 42 11.6 467.5	3	4 56 42.67 ^s 138.48	26 26 23.9 77.8
4	3 08 58.71 ^s 135.28	22 49 59.1 459.9	4	4 59 01.15 ^s 138.45	26 27 41.7 69.3
5	3 11 13.99 ^s 135.41	22 57 39.0 452.3	5	5 01 19.60 ^s 138.41	26 28 51.0 61.0
6	3 13 29.40 ^s 135.56	23 05 11.3 444.7	6	5 03 38.01 ^s 138.36	26 29 52.0 52.6
7	3 15 44.96 ^s 135.69	23 12 36.0 437.2	7	5 05 56.37 ^s 138.32	26 30 44.6 44.2
8	3 18 00.65 ^s 135.82	23 19 53.2 429.4	8	5 08 14.69 ^s 138.26	26 31 28.8 35.9
9	3 20 16.47 ^s 135.96	23 27 02.6 421.8	9	5 10 32.95 ^s 138.20	26 32 04.7 27.5
10	3 22 32.43 ^s 136.09	23 34 04.4 414.0	10	5 12 51.15 ^s 138.15	26 32 32.2 19.2
11	3 24 48.52 ^s 136.22	23 40 58.4 406.2	11	5 15 09.30 ^s 138.07	26 32 51.4 10.8
12	3 27 04.74 ^s 136.34	23 47 44.6 398.5	12	5 17 27.37 ^s 138.00	26 33 02.2 + 2.6
13	3 29 21.08 ^s 136.47	23 54 23.1 390.6	13	5 19 45.37 ^s 137.92	26 33 04.8 - 5.8
14	3 31 37.55 ^s 136.59	24 00 53.7 382.7	14	5 22 03.29 ^s 137.84	26 32 59.0 14.1
15	3 33 54.14 ^s 136.70	24 07 16.4 374.9	15	5 24 21.13 ^s 137.75	26 32 44.9 22.3
16	3 36 10.84 ^s 136.82	24 13 31.3 366.9	16	5 26 38.88 ^s 137.66	26 32 22.6 30.7
17	3 38 27.66 ^s 136.93	24 19 38.2 358.9	17	5 28 56.54 ^s 137.57	26 31 51.9 38.8
18	3 40 44.59 ^s 137.04	24 25 37.1 351.0	18	5 31 14.11 ^s 137.46	26 31 13.1 47.1
19	3 43 01.63 ^s 137.15	24 31 28.1 343.0	19	5 33 31.57 ^s 137.35	26 30 26.0 55.2
20	3 45 18.78 ^s 137.25	24 37 11.1 334.9	20	5 35 48.92 ^s 137.24	26 29 30.8 63.5
21	3 47 36.03 ^s 137.35	24 42 46.0 326.9	21	5 38 06.16 ^s 137.13	26 28 27.3 71.6
22	3 49 53.38 ^s 137.45	24 48 12.9 318.8	22	5 40 23.29 ^s 137.00	26 27 15.7 79.7
23	3 52 10.83 ^s 137.54	24 53 31.7 +310.7	23	5 42 40.29 ^s 136.88	26 25 56.0 - 87.9
24	3 54 28.37 ^s	+24 58 42.4	24	5 44 57.17 ^s	+26 24 28.1

MOON, 1935

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination				
Thursday, January 17							Saturday, January 19								
0	h	m	s	+	26	24	28.1	0	h	m	s	+	22	46	15.5
1	5	44	57.17	136.75	26	22	52.2	1	7	30	42.58	126.32	22	38	55.2
2	5	47	13.92	136.61	26	21	08.1	2	7	32	48.90	126.06	22	31	28.9
3	5	49	30.53	136.47	26	19	16.1	3	7	34	54.96	125.78	22	23	56.6
4	5	51	47.00	136.32	26	17	16.0	4	7	37	00.74	125.51	22	16	18.4
5	5	54	03.32	136.18	26	15	08.0	5	7	39	06.25	125.24	22	08	34.3
6	5	56	19.50	136.03	26	12	52.0	6	7	41	11.49	124.96	22	00	44.4
7	5	58	35.53	135.86	26	10	28.1	7	7	43	16.45	124.69	21	52	48.8
8	6	00	51.39	135.71	26	07	56.3	8	7	45	21.14	124.42	21	44	47.5
9	6	03	07.10	135.54	26	05	16.7	9	7	47	25.56	124.15	21	36	40.5
10	6	05	22.64	135.37	26	02	29.2	10	7	49	29.71	123.88	21	28	27.9
11	6	07	38.01	135.19	25	59	33.9	11	7	51	33.59	123.59	21	20	09.9
12	6	09	53.20	135.02	25	56	30.8	12	7	53	37.18	123.33	21	11	46.3
13	6	12	08.22	134.84	25	53	20.1	13	7	55	40.51	123.05	21	03	17.3
14	6	14	23.06	134.64	25	50	01.6	14	7	57	43.56	122.78	20	54	43.0
15	6	16	37.70	134.46	25	46	35.5	15	7	59	46.34	122.51	20	46	03.3
16	6	18	52.16	134.27	25	43	01.7	16	8	01	48.85	122.24	20	37	18.4
17	6	21	06.43	134.06	25	39	20.4	17	8	03	51.09	121.96	20	28	28.3
18	6	23	20.49	133.87	25	35	31.6	18	8	05	53.05	121.69	20	19	33.0
19	6	25	34.36	133.66	25	31	35.2	19	8	07	54.74	121.43	20	10	32.6
20	6	27	48.02	133.46	25	27	31.4	20	8	09	56.17	121.15	20	01	27.2
21	6	30	01.48	133.24	25	23	20.1	21	8	11	57.32	120.88	19	52	16.8
22	6	32	14.72	133.03	25	19	01.5	22	8	13	58.20	120.62	19	43	01.5
23	6	34	27.75	132.81	+25	14	35.6	23	8	15	58.82	120.35	+19	33	41.3
	6	36	40.56	132.59			-273.3		8	17	59.17	120.08			-565.0
Friday, January 18							Sunday, January 20								
0	6	38	53.15	132.37	+25	10	02.3	0	8	19	59.25	119.82	+19	24	16.3
1	6	41	05.52	132.14	25	05	21.8	1	8	21	59.07	119.55	19	14	46.5
2	6	43	17.66	131.91	25	00	34.1	2	8	23	58.62	119.29	19	05	12.1
3	6	45	29.57	131.68	24	55	39.2	3	8	25	57.91	119.03	18	55	32.9
4	6	47	41.25	131.44	24	50	37.2	4	8	27	56.94	118.77	18	45	49.2
5	6	49	52.69	131.21	24	45	28.1	5	8	29	55.71	118.51	18	36	00.9
6	6	52	03.90	130.97	24	40	12.0	6	8	31	54.22	118.26	18	26	08.1
7	6	54	14.87	130.72	24	34	48.9	7	8	33	52.48	118.01	18	16	10.9
8	6	56	25.59	130.48	24	29	18.9	8	8	35	50.47	117.74	18	06	09.2
9	6	58	36.07	130.24	24	23	42.0	9	8	37	48.21	117.49	17	56	03.3
10	7	00	46.31	129.98	24	17	58.2	10	8	39	45.70	117.24	17	45	53.1
11	7	02	56.29	129.73	24	12	07.7	11	8	41	42.94	116.99	17	35	38.7
12	7	05	06.02	129.48	24	06	10.4	12	8	43	39.93	116.74	17	25	20.1
13	7	07	15.50	129.22	24	00	06.4	13	8	45	36.67	116.50	17	14	57.4
14	7	09	24.72	128.96	23	53	55.8	14	8	47	33.17	116.25	17	04	30.6
15	7	11	33.68	128.71	23	47	38.6	15	8	49	29.42	116.01	16	53	59.8
16	7	13	42.39	128.45	23	41	14.9	16	8	51	25.43	115.77	16	43	25.1
17	7	15	50.84	128.19	23	34	44.6	17	8	53	21.20	115.54	16	32	46.5
18	7	17	59.03	127.92	23	28	07.9	18	8	55	16.74	115.30	16	22	04.0
19	7	20	06.95	127.66	23	21	24.9	19	8	57	12.04	115.06	16	11	17.7
20	7	22	14.61	127.39	23	14	35.5	20	8	59	07.10	114.84	16	00	27.7
21	7	24	22.00	127.13	23	07	39.8	21	9	01	01.94	114.60	15	49	33.9
22	7	26	29.13	126.86	23	00	37.9	22	9	02	56.54	114.38	15	38	36.6
23	7	28	35.99	126.59	22	53	29.7	23	9	04	50.92	114.15	15	27	35.6
24	7	30	42.58		+22	46	15.5	24	9	06	45.07		+15	16	31.1
							-434.2								-664.5

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Monday, January 21					Wednesday, January 23				
0	9 06 45.07	113.93	+15 16 31.1	-668.0	0	10 34 36.57	106.80	+ 5 31 32.1	-779.1
1	9 08 39.00	113.72	15 05 23.1	671.4	1	10 36 23.37	106.75	5 18 33.0	780.3
2	9 10 32.72	113.49	14 54 11.7	674.9	2	10 38 10.12	106.68	5 05 32.7	781.5
3	9 12 26.21	113.29	14 42 56.8	678.1	3	10 39 56.80	106.62	4 52 31.2	782.6
4	9 14 19.50	113.07	14 31 38.7	681.4	4	10 41 43.42	106.57	4 39 28.6	783.7
5	9 16 12.57	112.86	14 20 17.3	684.7	5	10 43 29.99	106.52	4 26 24.9	784.7
6	9 18 05.43	112.66	14 08 52.6	687.8	6	10 45 16.51	106.47	4 13 20.2	785.8
7	9 19 58.09	112.45	13 57 24.8	691.0	7	10 47 02.98	106.44	4 00 14.4	786.8
8	9 21 50.54	112.25	13 45 53.8	694.1	8	10 48 49.42	106.39	3 47 07.6	787.7
9	9 23 42.79	112.06	13 34 19.7	697.1	9	10 50 35.81	106.37	3 33 59.9	788.5
10	9 25 34.85	111.86	13 22 42.6	700.1	10	10 52 22.18	106.33	3 20 51.4	789.5
11	9 27 26.71	111.66	13 11 02.5	703.0	11	10 54 08.51	106.30	3 07 41.9	790.2
12	9 29 18.37	111.48	12 59 19.5	705.9	12	10 55 54.81	106.28	2 54 31.7	791.0
13	9 31 09.85	111.29	12 47 33.6	708.8	13	10 57 41.09	106.27	2 41 20.7	791.7
14	9 33 01.14	111.10	12 35 44.8	711.5	14	10 59 27.36	106.25	2 28 09.0	792.4
15	9 34 52.24	110.92	12 23 53.3	714.3	15	11 01 13.61	106.24	2 14 56.6	793.1
16	9 36 43.16	110.75	12 11 59.0	716.9	16	11 02 59.85	106.23	2 01 43.5	793.7
17	9 38 33.91	110.57	12 00 02.1	719.6	17	11 04 46.08	106.23	1 48 29.8	794.2
18	9 40 24.48	110.40	11 48 02.5	722.2	18	11 06 32.31	106.23	1 35 15.6	794.7
19	9 42 14.88	110.23	11 36 00.3	724.8	19	11 08 18.54	106.24	1 22 00.9	795.2
20	9 44 05.11	110.07	11 23 55.5	727.3	20	11 10 04.78	106.25	1 08 45.7	795.7
21	9 45 55.18	109.91	11 11 48.2	729.7	21	11 11 51.03	106.26	0 55 30.0	796.1
22	9 47 45.09	109.74	10 59 38.5	732.1	22	11 13 37.29	106.28	0 42 13.9	796.4
23	9 49 34.83	109.59	+10 47 26.4	-734.5	23	11 15 23.57	106.30	+ 0 28 57.5	-796.7
Tuesday, January 22					Thursday, January 24				
0	9 51 24.42	109.44	+10 35 11.9	-736.8	0	11 17 09.87	106.33	+ 0 15 40.8	-797.0
1	9 53 13.86	109.29	10 22 55.1	739.1	1	11 18 56.20	106.36	+ 0 02 23.8	-797.3
2	9 55 03.15	109.14	10 10 36.0	741.3	2	11 20 42.56	106.39	- 0 10 53.5	797.5
3	9 56 52.29	109.00	9 58 14.7	743.5	3	11 22 28.95	106.43	0 24 11.0	797.6
4	9 58 41.29	108.86	9 45 51.2	745.6	4	11 24 15.38	106.47	0 37 28.6	797.7
5	10 00 30.15	108.72	9 33 25.6	747.7	5	11 26 01.85	106.52	0 50 46.3	797.8
6	10 02 18.87	108.59	9 20 57.9	749.8	6	11 27 48.37	106.57	1 04 04.1	797.8
7	10 04 07.46	108.46	9 08 28.1	751.8	7	11 29 34.94	106.63	1 17 21.9	797.8
8	10 05 55.92	108.33	8 55 56.3	753.7	8	11 31 21.57	106.68	1 30 39.7	797.8
9	10 07 44.25	108.21	8 43 22.6	755.6	9	11 33 08.25	106.75	1 43 57.5	797.7
10	10 09 32.46	108.10	8 30 47.0	757.5	10	11 34 55.00	106.82	1 57 15.2	797.5
11	10 11 20.56	107.98	8 18 09.5	759.3	11	11 36 41.82	106.88	2 10 32.7	797.4
12	10 13 08.54	107.87	8 05 30.2	761.1	12	11 38 28.70	106.96	2 23 50.1	797.1
13	10 14 56.41	107.76	7 52 49.1	762.8	13	11 40 15.66	107.05	2 37 07.2	796.9
14	10 16 44.17	107.65	7 40 06.3	764.5	14	11 42 02.71	107.12	2 50 24.1	796.6
15	10 18 31.82	107.55	7 27 21.8	766.2	15	11 43 49.83	107.22	3 03 40.7	796.3
16	10 20 19.37	107.45	7 14 35.6	767.7	16	11 45 37.05	107.31	3 16 57.0	795.9
17	10 22 06.82	107.36	7 01 47.9	769.4	17	11 47 24.36	107.40	3 30 12.9	795.5
18	10 23 54.18	107.27	6 48 58.5	770.8	18	11 49 11.76	107.51	3 43 28.4	795.0
19	10 25 41.45	107.18	6 36 07.7	772.4	19	11 50 59.27	107.61	3 56 43.4	794.5
20	10 27 28.63	107.10	6 23 15.3	773.7	20	11 52 46.88	107.72	4 09 57.9	793.9
21	10 29 15.73	107.02	6 10 21.6	775.2	21	11 54 34.60	107.84	4 23 11.8	793.4
22	10 31 02.75	106.95	5 57 26.4	776.5	22	11 56 22.44	107.95	4 36 25.2	792.7
23	10 32 49.70	106.87	5 44 29.9	-777.8	23	11 58 10.39	108.08	4 49 37.9	-792.0
24	10 34 36.57		+ 5 31 32.1		24	11 59 58.47		- 5 02 49.9	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Friday, January 25							Sunday, January 27						
0	h	m	s	°	'	"	0	h	m	s	°	'	"
1	11 59	58.47	108.21	5 02	49.9	-791.3	1	13 30	17.18	119.50	15 07	49.2	-699.3
2	12 01	46.68	108.34	5 16	01.2	-790.5	2	13 32	16.68	119.84	15 19	28.5	-696.0
3	12 03	35.02	108.47	5 29	11.7	-789.9	3	13 34	16.52	120.18	15 31	04.5	-692.7
4	12 05	23.49	108.61	5 42	21.5	-788.9	4	13 36	16.70	120.53	15 42	37.2	-689.3
5	12 07	12.10	108.76	5 55	30.4	-787.9	5	13 38	17.23	120.89	15 54	06.4	-685.8
6	12 09	00.86	108.91	6 08	38.3	-787.1	6	13 40	18.12	121.24	16 05	32.2	-682.2
7	12 10	49.77	109.06	6 21	45.4	-786.0	7	13 42	19.36	121.61	16 16	54.4	-678.6
8	12 12	38.83	109.22	6 34	51.4	-785.1	8	13 44	20.97	121.97	16 28	13.0	-674.9
9	12 14	28.05	109.39	6 47	56.5	-783.9	9	13 46	22.94	122.33	16 39	27.9	-671.2
10	12 16	17.44	109.55	7 01	00.4	-782.8	10	13 48	25.27	122.71	16 50	39.1	-667.3
11	12 18	06.99	109.72	7 14	03.2	-781.7	11	13 50	27.98	123.09	17 01	46.4	-663.5
12	12 19	56.71	109.89	7 27	04.9	-780.4	12	13 52	31.07	123.46	17 12	49.9	-659.5
13	12 21	46.60	110.08	7 40	05.3	-779.2	13	13 54	34.53	123.85	17 23	49.4	-655.4
14	12 23	36.68	110.26	7 53	04.5	-777.8	14	13 56	38.38	124.23	17 34	44.8	-651.4
15	12 25	26.94	110.45	8 06	02.3	-776.5	15	13 58	42.61	124.63	17 45	36.2	-647.1
16	12 27	17.39	110.64	8 18	58.8	-775.1	16	14 00	47.24	125.02	17 56	23.3	-643.0
17	12 29	08.03	110.84	8 31	53.9	-773.6	17	14 02	52.26	125.41	18 07	06.3	-638.6
18	12 30	58.87	111.04	8 44	47.5	-772.1	18	14 04	57.67	125.82	18 17	44.9	-634.2
19	12 32	49.91	111.25	8 57	39.6	-770.6	19	14 07	03.49	126.22	18 28	19.1	-629.7
20	12 34	41.16	111.46	9 10	30.2	-769.0	20	14 09	09.71	126.63	18 38	48.8	-625.1
21	12 36	32.62	111.68	9 23	19.2	-767.3	21	14 11	16.34	127.04	18 49	13.9	-620.6
22	12 38	24.30	111.89	9 36	06.5	-765.6	22	14 13	23.38	127.45	18 59	34.5	-615.8
23	12 40	16.19	112.12	9 48	52.1	-763.9	23	14 15	30.83	127.87	19 09	50.3	-611.1
	12 42	08.31	112.35	-10 01	36.0	-762.1		14 17	38.70	128.29	-19 20	01.4	-606.2
Saturday, January 26							Monday, January 28						
0	12 44	00.66	112.58	-10 14	18.1	-760.2	0	14 19	46.99	128.71	-19 30	07.6	-601.2
1	12 45	53.24	112.82	10 26	58.3	-758.4	1	14 21	55.70	129.13	19 40	08.8	-596.3
2	12 47	46.06	113.07	10 39	36.7	-756.4	2	14 24	04.83	129.57	19 50	05.1	-591.2
3	12 49	39.13	113.31	10 52	13.1	-754.3	3	14 26	14.40	129.99	19 59	56.3	-585.9
4	12 51	32.44	113.56	11 04	47.4	-752.4	4	14 28	24.39	130.42	20 09	42.2	-580.8
5	12 53	26.00	113.82	11 17	19.8	-750.2	5	14 30	34.81	130.86	20 19	23.0	-575.4
6	12 55	19.82	114.07	11 29	50.0	-748.1	6	14 32	45.67	131.30	20 28	58.4	-569.9
7	12 57	13.89	114.34	11 42	18.1	-745.8	7	14 34	56.97	131.73	20 38	28.3	-564.5
8	12 59	08.23	114.61	11 54	43.9	-743.5	8	14 37	08.70	132.18	20 47	52.8	-558.9
9	13 01	02.84	114.89	12 07	07.4	-741.3	9	14 39	20.88	132.62	20 57	11.7	-553.2
10	13 02	57.73	115.16	12 19	28.7	-738.8	10	14 41	33.50	133.06	21 06	24.9	-547.4
11	13 04	52.89	115.43	12 31	47.5	-736.4	11	14 43	46.56	133.51	21 15	32.3	-541.6
12	13 06	48.33	115.74	12 44	03.9	-733.9	12	14 46	00.07	133.96	21 24	33.9	-535.7
13	13 08	44.06	116.01	12 56	17.8	-731.3	13	14 48	14.03	134.40	21 33	29.6	-529.6
14	13 10	40.07	116.32	13 08	29.1	-728.8	14	14 50	28.43	134.86	21 42	19.2	-523.6
15	13 12	36.39	116.61	13 20	37.9	-726.1	15	14 52	43.29	135.32	21 51	02.8	-517.4
16	13 14	33.00	116.91	13 32	44.0	-723.3	16	14 54	58.61	135.76	21 59	40.2	-511.0
17	13 16	29.91	117.23	13 44	47.3	-720.6	17	14 57	14.37	136.22	22 08	11.2	-504.7
18	13 18	27.14	117.53	13 56	47.9	-717.7	18	14 59	30.59	136.68	22 16	35.9	-498.3
19	13 20	24.67	117.85	14 08	45.6	-714.8	19	15 01	47.27	137.13	22 24	54.2	-491.8
20	13 22	22.52	118.17	14 20	40.4	-711.8	20	15 04	04.40	137.58	22 33	06.0	-485.1
21	13 24	20.69	118.50	14 32	32.2	-708.8	21	15 06	21.98	138.05	22 41	11.1	-478.4
22	13 26	19.19	118.83	14 44	21.0	-705.7	22	15 08	40.53	138.50	22 49	09.5	-471.6
23	13 28	18.02	119.16	14 56	06.7	-702.5	23	15 10	58.03	138.95	22 57	01.1	-464.7
24	13 30	17.18		-15 07	49.2		24	15 13	17.48		-23 04	45.8	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Tuesday, January 29							Thursday, January 31						
0	h	m	s	°	'	"	0	h	m	s	°	'	"
1	15	13	17.48	139.41	-23	04 45.8	1	17	12	44.18	157.84	-26	32 34.1
2	15	15	36.89	139.87	23	12 23.5	2	17	15	22.02	157.88	26	32 55.7
3	15	17	56.76	140.33	23	19 54.2	3	17	18	00.10	158.08	26	33 06.4
4	15	20	17.09	140.79	23	27 17.7	4	17	20	38.40	158.30	26	33 06.2
5	15	22	37.88	141.24	23	34 33.9	5	17	23	16.93	158.53	26	32 55.0
6	15	24	59.12	141.69	23	41 42.8	6	17	25	55.66	158.73	26	32 32.9
7	15	27	20.81	142.15	23	48 44.2	7	17	28	34.59	158.93	26	31 59.7
8	15	29	42.96	142.60	23	55 38.1	8	17	31	13.71	159.12	26	31 15.5
9	15	32	05.56	143.05	24	02 24.4	9	17	33	53.02	159.31	26	30 20.1
10	15	34	28.61	143.50	24	09 03.0	10	17	36	32.49	159.47	26	29 13.7
11	15	36	52.11	143.95	24	15 33.8	11	17	39	12.13	159.64	26	27 56.0
12	15	39	16.06	144.40	24	21 56.7	12	17	41	51.92	159.79	26	26 27.1
13	15	41	40.46	144.84	24	28 11.6	13	17	44	31.86	160.07	26	24 47.0
14	15	44	05.30	145.28	24	34 18.5	14	17	47	11.93	160.19	26	22 55.6
15	15	46	30.58	145.72	24	40 17.2	15	17	49	52.12	160.31	26	20 53.0
16	15	48	56.30	146.16	24	46 07.6	16	17	52	32.43	160.42	26	18 39.0
17	15	51	22.46	146.59	24	51 49.7	17	17	55	12.85	160.51	26	16 13.6
18	15	53	49.05	147.02	24	57 23.4	18	17	57	53.36	160.59	26	13 37.0
19	15	56	16.07	147.45	25	02 48.5	19	18	00	33.95	160.67	26	10 49.0
20	15	58	43.52	147.87	25	08 05.1	20	18	03	14.62	160.73	26	07 49.6
21	16	01	11.39	148.29	25	13 13.0	21	18	05	55.35	160.79	26	04 38.9
22	16	03	39.68	148.71	25	18 12.1	22	18	08	36.14	160.84	26	01 16.8
23	16	06	08.39	149.12	25	23 02.3	23	18	11	16.98	160.87	25	57 43.3
	16	08	37.51	149.53	-25	27 43.6		18	13	57.85	160.90	-25	53 58.5
Wednesday, January 30							Friday, February 1						
0	16	11	07.04	149.94	-25	32 15.9	0	18	16	38.75	160.92	-25	50 02.2
1	16	13	36.98	150.33	25	36 39.1	1	18	19	19.67	160.92	25	45 54.6
2	16	16	07.31	150.73	25	40 53.0	2	18	22	00.59	160.91	25	41 35.6
3	16	18	38.04	151.12	25	44 57.6	3	18	24	41.50	160.91	25	37 05.2
4	16	21	09.16	151.51	25	48 52.9	4	18	27	22.41	160.88	25	32 23.5
5	16	23	40.67	151.88	25	52 38.7	5	18	30	03.29	160.85	25	27 30.5
6	16	26	12.55	152.26	25	56 15.0	6	18	32	44.14	160.81	25	22 26.1
7	16	28	44.81	152.62	25	59 41.7	7	18	35	24.95	160.76	25	17 10.5
8	16	31	17.43	152.99	26	02 58.7	8	18	38	05.71	160.71	25	11 43.7
9	16	33	50.42	153.34	26	06 05.9	9	18	40	46.42	160.63	25	06 05.6
10	16	36	23.76	153.70	26	09 03.3	10	18	43	27.05	160.56	25	00 16.3
11	16	38	57.46	154.04	26	11 50.8	11	18	46	07.61	160.47	24	54 15.8
12	16	41	31.50	154.38	26	14 28.3	12	18	48	48.08	160.37	24	48 04.2
13	16	44	05.88	154.70	26	16 55.7	13	18	51	28.45	160.27	24	41 41.5
14	16	46	40.58	155.03	26	19 13.0	14	18	54	08.72	160.15	24	35 07.7
15	16	49	15.61	155.35	26	21 20.1	15	18	56	48.87	160.03	24	28 23.0
16	16	51	50.96	155.65	26	23 16.9	16	18	59	28.90	159.91	24	21 27.2
17	16	54	26.61	155.95	26	25 03.4	17	19	02	08.81	159.76	24	14 20.5
18	16	57	02.56	156.25	26	26 39.4	18	19	04	48.57	159.62	24	07 03.0
19	16	59	38.81	156.53	26	28 05.1	19	19	07	28.19	159.46	23	59 34.6
20	17	02	15.34	156.82	26	29 20.2	20	19	10	07.65	159.31	23	51 55.6
21	17	04	52.16	157.08	26	30 24.7	21	19	12	46.96	159.13	23	44 05.8
22	17	07	29.24	157.34	26	31 18.5	22	19	15	26.09	158.96	23	36 05.3
23	17	10	06.58	157.60	26	32 01.7	23	19	18	05.05	158.77	23	27 54.3
	17	12	44.18		-26	32 34.1		19	20	43.82		-23	19 32.8

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Saturday, February 2					Monday, February 4				
0	19 20 43.82	158.58	-23 19 32.8	+512.0	0	21 22 33.34	144.80	-13 41 56.1	+897.6
1	19 23 22.40	158.39	23 11 00.8	522.3	1	21 24 58.14	144.49	13 26 58.5	902.7
2	19 26 00.79	158.18	23 02 18.5	532.7	2	21 27 22.63	144.19	13 11 55.8	907.7
3	19 28 38.97	157.96	22 53 25.8	542.9	3	21 29 46.82	143.88	12 56 48.1	912.5
4	19 31 16.93	157.75	22 44 22.9	553.0	4	21 32 10.70	143.57	12 41 35.6	917.3
5	19 33 54.68	157.53	22 35 09.9	563.1	5	21 34 34.27	143.28	12 26 18.3	921.8
6	19 36 32.21	157.29	22 25 46.8	573.1	6	21 36 57.55	142.98	12 10 56.5	926.4
7	19 39 09.50	157.06	22 16 13.7	583.0	7	21 39 20.53	142.68	11 55 30.1	930.6
8	19 41 46.56	156.82	22 06 30.7	592.8	8	21 41 43.21	142.39	11 39 59.5	934.9
9	19 44 23.38	156.58	21 56 37.9	602.5	9	21 44 05.60	142.10	11 24 24.6	938.9
10	19 46 59.96	156.32	21 46 35.4	612.2	10	21 46 27.70	141.81	11 08 45.7	942.9
11	19 49 36.28	156.06	21 36 23.2	621.8	11	21 48 49.51	141.52	10 53 02.8	946.7
12	19 52 12.34	155.80	21 26 01.4	631.2	12	21 51 11.03	141.24	10 37 16.1	950.4
13	19 54 48.14	155.54	21 15 30.2	640.5	13	21 53 32.27	140.96	10 21 25.7	953.9
14	19 57 23.68	155.26	21 04 49.7	649.9	14	21 55 53.23	140.69	10 05 31.8	957.4
15	19 59 58.94	154.99	20 53 59.8	659.0	15	21 58 13.92	140.41	9 49 34.4	960.6
16	20 02 33.93	154.71	20 43 00.8	668.0	16	22 00 34.33	140.14	9 33 33.8	963.8
17	20 05 08.64	154.43	20 31 52.8	677.1	17	22 02 54.47	139.88	9 17 30.0	966.9
18	20 07 43.07	154.14	20 20 35.7	685.9	18	22 05 14.35	139.61	9 01 23.1	969.7
19	20 10 17.21	153.85	20 09 09.8	694.6	19	22 07 33.96	139.35	8 45 13.4	972.6
20	20 12 51.06	153.56	19 57 35.2	703.3	20	22 09 53.31	139.10	8 29 00.8	975.2
21	20 15 24.62	153.27	19 45 51.9	711.8	21	22 12 12.41	138.84	8 12 45.6	977.7
22	20 17 57.89	152.96	19 34 00.1	720.3	22	22 14 31.25	138.60	7 56 27.9	980.2
23	20 20 30.85	152.66	-19 21 59.8	+728.6	23	22 16 49.85	138.35	-7 40 07.7	+982.4
Sunday, February 3					Tuesday, February 5				
0	20 23 03.51	152.36	-19 09 51.2	+736.8	0	22 19 08.20	138.11	-7 23 45.3	+984.6
1	20 25 35.87	152.05	18 57 34.4	744.9	1	22 21 26.31	137.87	7 07 20.7	986.5
2	20 28 07.92	151.74	18 45 09.5	752.9	2	22 23 44.18	137.63	6 50 54.2	988.5
3	20 30 39.66	151.44	18 32 36.6	760.8	3	22 26 01.81	137.41	6 34 25.7	990.3
4	20 33 11.10	151.12	18 19 55.8	768.5	4	22 28 19.22	137.17	6 17 55.4	991.9
5	20 35 42.22	150.81	18 07 07.3	776.1	5	22 30 36.39	136.96	6 01 23.5	993.4
6	20 38 13.03	150.49	17 54 11.2	783.6	6	22 32 53.35	136.74	5 44 50.1	994.8
7	20 40 43.52	150.18	17 41 07.6	791.0	7	22 35 10.09	136.52	5 28 15.3	996.2
8	20 43 13.70	149.86	17 27 56.6	798.3	8	22 37 26.61	136.32	5 11 39.1	997.3
9	20 45 43.56	149.55	17 14 38.3	805.4	9	22 39 42.93	136.10	4 55 01.8	998.3
10	20 48 13.11	149.22	17 01 12.9	812.5	10	22 41 59.03	135.91	4 38 23.5	999.2
11	20 50 42.33	148.91	16 47 40.4	819.4	11	22 44 14.94	135.71	4 21 44.3	1000.1
12	20 53 11.24	148.59	16 34 01.0	826.1	12	22 46 30.65	135.52	4 05 04.2	1000.8
13	20 55 39.83	148.27	16 20 14.9	832.8	13	22 48 46.17	135.33	3 48 23.4	1001.3
14	20 58 08.10	147.95	16 06 22.1	839.4	14	22 51 01.50	135.14	3 31 42.1	1001.8
15	21 00 36.05	147.63	15 52 22.7	845.7	15	22 53 16.64	134.97	3 15 00.3	1002.1
16	21 03 03.68	147.31	15 38 17.0	852.0	16	22 55 31.61	134.79	2 58 18.2	1002.3
17	21 05 30.99	147.00	15 24 05.0	858.1	17	22 57 46.40	134.61	2 41 35.9	1002.4
18	21 07 57.99	146.68	15 09 46.9	864.2	18	23 00 01.01	134.45	2 24 53.5	1002.4
19	21 10 24.67	146.36	14 55 22.7	870.1	19	23 02 15.46	134.29	2 08 11.1	1002.3
20	21 12 51.03	146.05	14 40 52.6	875.8	20	23 04 29.75	134.13	1 51 28.8	1002.1
21	21 15 17.08	145.74	14 26 16.8	881.4	21	23 06 43.88	133.98	1 34 46.7	1001.7
22	21 17 42.82	145.42	14 11 35.4	887.0	22	23 08 57.86	133.82	1 18 05.0	1001.3
23	21 20 08.24	145.10	13 56 48.4	+892.3	23	23 11 11.68	133.68	1 01 23.7	+1000.7
24	21 22 33.34		-13 41 56.1		24	23 13 25.36		0 44 43.0	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Wednesday, February 6							Friday, February 8						
0	23	13	25.36	133.54	-	0 44 43.0	0	0 58 56.90	131.78	+	11 52 03.1	+854.7	
1	23	15	38.90	133.41		0 28 03.0	1	1 01 08.68	131.83		12 06 17.8	849.5	
2	23	17	52.31	133.27	-	0 11 23.7	2	1 03 20.51	131.88		12 20 27.3	844.5	
3	23	20	05.58	133.15	+	0 05 14.6	3	1 05 32.39	131.95		12 34 31.8	839.3	
4	23	22	18.73	133.02		0 21 52.0	4	1 07 44.34	132.01		12 48 31.1	834.0	
5	23	24	31.75	132.91		0 38 28.2	5	1 09 56.35	132.08		13 02 25.1	828.7	
6	23	26	44.66	132.79		0 55 03.2	6	1 12 08.43	132.14		13 16 13.8	823.3	
7	23	28	57.45	132.69		1 11 36.9	7	1 14 20.57	132.21		13 29 57.1	817.8	
8	23	31	10.14	132.58		1 28 09.2	8	1 16 32.78	132.29		13 43 34.9	812.3	
9	23	33	22.72	132.48		1 44 39.9	9	1 18 45.07	132.36		13 57 07.2	806.7	
10	23	35	35.20	132.38		2 01 09.0	10	1 20 57.43	132.44		14 10 33.9	801.1	
11	23	37	47.58	132.29		2 17 36.4	11	1 23 09.87	132.52		14 23 55.0	795.3	
12	23	39	59.87	132.21		2 34 02.0	12	1 25 22.39	132.60		14 37 10.3	789.6	
13	23	42	12.08	132.12		2 50 25.6	13	1 27 34.99	132.69		14 50 19.9	783.7	
14	23	44	24.20	132.04		3 06 47.2	14	1 29 47.68	132.77		15 03 23.6	777.8	
15	23	46	36.24	131.97		3 23 06.7	15	1 32 00.45	132.87		15 16 21.4	771.8	
16	23	48	48.21	131.90		3 39 23.9	16	1 34 13.32	132.95		15 29 13.2	765.8	
17	23	51	00.11	131.84		3 55 38.9	17	1 36 26.27	133.04		15 41 59.0	759.8	
18	23	53	11.95	131.77		4 11 51.4	18	1 38 39.31	133.14		15 54 38.8	753.5	
19	23	55	23.72	131.72		4 28 01.4	19	1 40 52.45	133.23		16 07 12.3	747.4	
20	23	57	35.44	131.67		4 44 08.8	20	1 43 05.68	133.34		16 19 39.7	741.2	
21	23	59	47.11	131.62		5 00 13.5	21	1 45 19.02	133.43		16 32 00.9	734.8	
22	0 01	58.73	131.57		+	5 16 15.4	22	1 47 32.45	133.53	+	16 44 15.7	728.4	
23	0 04	10.30	131.54		+	5 32 14.5	23	1 49 45.98	133.63	+	16 56 24.1	+722.0	
Thursday, February 7							Saturday, February 9						
0	0 06	21.84	131.50	+	5 48 10.5	+953.0	0	1 51 59.61	133.74	+	17 08 26.1	+715.6	
1	0 08	33.34	131.47		6 04 03.5	949.9	1	1 54 13.35	133.84		17 20 21.7	709.0	
2	0 10	44.81	131.44		6 19 53.4	946.6	2	1 56 27.19	133.94		17 32 10.7	702.4	
3	0 12	56.25	131.42		6 35 40.0	943.3	3	1 58 41.13	134.06		17 43 53.1	695.7	
4	0 15	07.67	131.40		6 51 23.3	939.9	4	2 00 55.19	134.16		17 55 28.8	689.1	
5	0 17	19.07	131.38		7 07 03.2	936.4	5	2 03 09.35	134.27		18 06 57.9	682.3	
6	0 19	30.45	131.37		7 22 39.6	932.8	6	2 05 23.62	134.37		18 18 20.2	675.5	
7	0 21	41.82	131.36		7 38 12.4	929.1	7	2 07 37.99	134.49		18 29 35.7	668.6	
8	0 23	53.18	131.36		7 53 41.5	925.4	8	2 09 52.48	134.60		18 40 44.3	661.8	
9	0 26	04.54	131.36		8 09 06.9	921.6	9	2 12 07.08	134.71		18 51 46.1	654.9	
10	0 28	15.90	131.36		8 24 28.5	917.7	10	2 14 21.79	134.82		19 02 41.0	647.8	
11	0 30	27.26	131.37		8 39 46.2	913.6	11	2 16 36.61	134.94		19 13 28.8	640.8	
12	0 32	38.63	131.38		8 54 59.8	909.6	12	2 18 51.55	135.05		19 24 09.6	633.7	
13	0 34	50.01	131.39		9 10 09.4	905.4	13	2 21 06.60	135.16		19 34 43.3	626.6	
14	0 37	01.40	131.41		9 25 14.8	901.1	14	2 23 21.76	135.27		19 45 09.9	619.4	
15	0 39	12.81	131.44		9 40 15.9	896.9	15	2 25 37.03	135.38		19 55 29.3	612.2	
16	0 41	24.25	131.46		9 55 12.8	892.4	16	2 27 52.41	135.50		20 05 41.5	604.9	
17	0 43	35.71	131.49		10 10 05.2	888.0	17	2 30 07.91	135.61		20 15 46.4	597.6	
18	0 45	47.20	131.52		10 24 53.2	883.4	18	2 32 23.52	135.72		20 25 44.0	590.2	
19	0 47	58.72	131.55		10 39 36.6	878.9	19	2 34 39.24	135.84		20 35 34.2	582.9	
20	0 50	10.27	131.59		10 54 15.5	874.1	20	2 36 55.08	135.94		20 45 17.1	575.4	
21	0 52	21.86	131.64		11 08 49.6	869.4	21	2 39 11.02	136.06		20 54 52.5	567.9	
22	0 54	33.50	131.67		11 23 19.0	864.5	22	2 41 27.08	136.16		21 04 20.4	560.4	
23	0 56	45.17	131.73		11 37 43.5	+859.6	23	2 43 43.24	136.28		21 13 40.8	+552.9	
24	0 58	56.90		+	11 52 03.1		24	2 45 59.52		+	21 22 53.7		

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Sunday, February 10							Tuesday, February 12						
0	2 ^h 45 ^m 59.52 ^s	136.38	+21 22 53.7	0	4 ^h 36 ^m 32.93 ^s	138.95	+26 07 42.0						
1	2 48 15.90	136.49	21 31 59.0 +545.3	1	4 38 51.88	138.92	26 10 13.6 +151.6						
2	2 50 32.39	136.60	21 40 56.7 537.7	2	4 41 10.80	138.88	26 12 36.7 143.1						
3	2 52 48.99	136.71	21 49 46.7 530.0	3	4 43 29.68	138.85	26 14 51.4 134.7						
4	2 55 05.70	136.80	21 58 29.0 522.3	4	4 45 48.53	138.80	26 16 57.6 126.2						
5	2 57 22.50	136.91	22 07 03.5 514.5	5	4 48 07.33	138.76	26 18 55.4 117.8						
6	2 59 39.41	137.02	22 15 30.3 506.8	6	4 50 26.09	138.70	26 20 44.7 109.3						
7	3 01 56.43	137.11	22 23 49.3 499.0	7	4 52 44.79	138.65	26 22 25.5 100.8						
8	3 04 13.54	137.21	22 32 00.5 491.2	8	4 55 03.44	138.59	26 23 58.0 92.5						
9	3 06 30.75	137.31	22 40 03.8 483.3	9	4 57 22.03	138.52	26 25 22.0 84.0						
10	3 08 48.06	137.40	22 47 59.2 475.4	10	4 59 40.55	138.45	26 26 37.6 75.6						
11	3 11 05.46	137.50	22 55 46.6 467.4	11	5 01 59.00	138.38	26 27 44.9 67.3						
12	3 13 22.96	137.59	23 03 26.1 459.5	12	5 04 17.38	138.30	26 28 43.7 58.8						
13	3 15 40.55	137.68	23 10 57.6 451.5	13	5 06 35.68	138.22	26 29 34.1 50.4						
14	3 17 58.23	137.76	23 18 21.1 443.5	14	5 08 53.90	138.14	26 30 16.2 42.1						
15	3 20 15.99	137.86	23 25 36.5 435.4	15	5 11 12.04	138.04	26 30 50.0 33.8						
16	3 22 33.85	137.93	23 32 43.9 427.4	16	5 13 30.08	137.95	26 31 15.4 25.4						
17	3 24 51.78	138.01	23 39 43.1 419.2	17	5 15 48.03	137.85	26 31 32.5 17.1						
18	3 27 09.79	138.09	23 46 34.3 411.2	18	5 18 05.88	137.75	26 31 41.3 + 0.6						
19	3 29 27.88	138.17	23 53 17.3 403.0	19	5 20 23.63	137.64	26 31 41.9 - 7.7						
20	3 31 46.05	138.24	23 59 52.1 394.8	20	5 22 41.27	137.53	26 31 34.2 15.9						
21	3 34 04.29	138.31	24 06 18.7 386.6	21	5 24 58.80	137.41	26 31 18.3 24.2						
22	3 36 22.60	138.38	24 12 37.1 378.4	22	5 27 16.21	137.29	26 30 54.1 32.4						
23	3 38 40.98	138.44	+24 18 47.3 370.2	23	5 29 33.50	137.16	+26 30 21.7 - 40.5						
			+361.9										
Monday, February 11							Wednesday, February 13						
0	3 40 59.42	138.50	+24 24 49.2	0	5 31 50.66		+26 29 41.2						
1	3 43 17.92	138.57	24 30 42.8 +353.6	1	5 34 07.70	137.04	26 28 52.5 - 48.7						
2	3 45 36.49	138.62	24 36 28.2 345.4	2	5 36 24.61	136.91	26 27 55.7 56.8						
3	3 47 55.11	138.67	24 42 05.3 337.1	3	5 38 41.37	136.76	26 26 50.8 64.9						
4	3 50 13.78	138.72	24 47 34.0 328.7	4	5 40 58.00	136.63	26 25 37.9 72.9						
5	3 52 32.50	138.77	24 52 54.4 320.4	5	5 43 14.49	136.49	26 24 16.8 81.1						
6	3 54 51.27	138.81	24 58 06.4 312.0	6	5 45 30.82	136.33	26 22 47.8 89.0						
7	3 57 10.08	138.85	25 03 10.0 303.6	7	5 47 47.00	136.18	26 21 10.8 97.0						
8	3 59 28.93	138.89	25 08 05.3 295.3	8	5 50 03.03	136.03	26 19 25.8 105.0						
9	4 01 47.82	138.92	25 12 52.2 286.9	9	5 52 18.90	135.87	26 17 32.9 112.9						
10	4 04 06.74	138.95	25 17 30.7 278.5	10	5 54 34.61	135.71	26 15 32.0 120.9						
11	4 06 25.69	138.97	25 22 00.7 270.0	11	5 56 50.14	135.53	26 13 23.3 128.7						
12	4 08 44.66	139.00	25 26 22.3 261.6	12	5 59 05.51	135.37	26 11 06.8 136.5						
13	4 11 03.66	139.01	25 30 35.5 253.2	13	6 01 20.70	135.19	26 08 42.4 144.4						
14	4 13 22.67	139.03	25 34 40.2 244.7	14	6 03 35.72	135.02	26 06 10.3 152.1						
15	4 15 41.70	139.04	25 38 36.5 236.3	15	6 05 50.55	134.83	26 03 30.4 159.9						
16	4 18 00.74	139.04	25 42 24.3 227.8	16	6 08 05.20	134.65	26 00 42.8 167.6						
17	4 20 19.78	139.05	25 46 03.6 219.3	17	6 10 19.66	134.46	25 57 47.5 175.3						
18	4 22 38.83	139.04	25 49 34.5 210.9	18	6 12 33.93	134.27	25 54 44.6 182.9						
19	4 24 57.87	139.04	25 52 57.0 202.5	19	6 14 48.01	134.08	25 51 34.1 190.5						
20	4 27 16.91	139.03	25 56 10.9 193.9	20	6 17 01.88	133.87	25 48 16.0 198.1						
21	4 29 35.94	139.02	25 59 16.4 185.5	21	6 19 15.56	133.68	25 44 50.4 205.6						
22	4 31 54.96	139.00	26 02 13.4 177.0	22	6 21 29.03	133.47	25 41 17.3 213.1						
23	4 34 13.96	138.97	26 05 02.0 168.6	23	6 23 42.30	133.27	25 37 36.7 220.6						
24	4 36 32.93		+26 07 42.0 +160.0	24	6 25 55.35	133.05	+25 33 48.7 -228.0						

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Thursday, February 14							Saturday, February 16						
0	h	m	s	+	°	'	0	h	m	s	+	°	'
0	6 25	55.35		25	33	48.7	0	8 07	38.49		20	20	32.4
1	6 28	08.20	132.85	25	29	53.4	1	8 09	39.36	120.87	20	11	36.9
2	6 30	20.82	132.62	25	25	50.7	2	8 11	39.98	120.62	20	02	36.3
3	6 32	33.23	132.41	25	21	40.7	3	8 13	40.34	120.36	19	53	30.7
4	6 34	45.43	132.20	25	17	23.4	4	8 15	40.45	120.11	19	44	20.2
5	6 36	57.39	131.96	25	12	58.9	5	8 17	40.31	119.86	19	35	04.9
6	6 39	09.13	131.74	25	08	27.3	6	8 19	39.92	119.61	19	25	44.7
7	6 41	20.65	131.52	25	03	48.5	7	8 21	39.28	119.36	19	16	19.7
8	6 43	31.93	131.28	24	59	02.6	8	8 23	38.39	119.11	19	06	50.0
9	6 45	42.99	131.06	24	54	09.7	9	8 25	37.25	118.86	18	57	15.6
10	6 47	53.81	130.82	24	49	09.8	10	8 27	35.86	118.61	18	47	36.6
11	6 50	04.39	130.58	24	44	03.0	11	8 29	34.23	118.37	18	37	53.0
12	6 52	14.73	130.34	24	38	49.2	12	8 31	32.36	118.13	18	28	04.9
13	6 54	24.83	130.10	24	33	28.6	13	8 33	30.25	117.89	18	18	12.4
14	6 56	34.69	129.86	24	28	01.1	14	8 35	27.89	117.64	18	08	15.4
15	6 58	44.31	129.62	24	22	26.9	15	8 37	25.30	117.41	17	58	14.0
16	7 00	53.69	129.38	24	16	46.0	16	8 39	22.46	117.16	17	48	08.3
17	7 03	02.81	129.12	24	10	58.3	17	8 41	19.40	116.94	17	37	58.4
18	7 05	11.69	128.88	24	05	04.1	18	8 43	16.10	116.70	17	27	44.2
19	7 07	20.32	128.63	23	59	03.2	19	8 45	12.57	116.47	17	17	25.9
20	7 09	28.70	128.38	23	52	55.8	20	8 47	08.81	116.24	17	07	03.4
21	7 11	36.83	128.13	23	46	42.0	21	8 49	04.82	116.01	16	56	36.9
22	7 13	44.70	127.87	23	40	21.6	22	8 51	00.60	115.78	16	46	06.4
23	7 15	52.32	127.62	23	33	54.9	23	8 52	56.16	115.56	16	35	31.9
		127.36				-393.1			115.34				-638.4
Friday, February 15							Sunday, February 17						
0	7 17	59.68	127.11	23	27	21.8	0	8 54	51.50	115.12	16	24	53.5
1	7 20	06.79	126.84	23	20	42.4	1	8 56	46.62	114.90	16	14	11.2
2	7 22	13.63	126.59	23	13	56.8	2	8 58	41.52	114.69	16	03	25.2
3	7 24	20.22	126.34	23	07	05.0	3	9 00	36.21	114.47	15	52	35.4
4	7 26	26.56	126.07	23	00	07.0	4	9 02	30.68	114.26	15	41	41.8
5	7 28	32.63	125.82	22	53	02.9	5	9 04	24.94	114.05	15	30	44.6
6	7 30	38.45	125.55	22	45	52.8	6	9 06	18.99	113.85	15	19	43.8
7	7 32	44.00	125.29	22	38	36.6	7	9 08	12.84	113.64	15	08	39.5
8	7 34	49.29	125.04	22	31	14.5	8	9 10	06.48	113.44	14	57	31.6
9	7 36	54.33	124.77	22	23	46.5	9	9 11	59.92	113.24	14	46	20.2
10	7 38	59.10	124.51	22	16	12.7	10	9 13	53.16	113.04	14	35	05.5
11	7 41	03.61	124.24	22	08	33.0	11	9 15	46.20	112.85	14	23	47.3
12	7 43	07.85	123.99	22	00	47.6	12	9 17	39.05	112.65	14	12	25.9
13	7 45	11.84	123.72	21	52	56.5	13	9 19	31.70	112.47	14	01	01.2
14	7 47	15.56	123.46	21	44	59.7	14	9 21	24.17	112.28	13	49	33.3
15	7 49	19.02	123.21	21	36	57.4	15	9 23	16.45	112.09	13	38	02.2
16	7 51	22.23	122.94	21	28	49.4	16	9 25	08.54	111.92	13	26	28.0
17	7 53	25.17	122.68	21	20	36.0	17	9 27	00.46	111.73	13	14	50.7
18	7 55	27.85	122.42	21	12	17.1	18	9 28	52.19	111.56	13	03	10.4
19	7 57	30.27	122.16	21	03	52.9	19	9 30	43.75	111.39	12	51	27.1
20	7 59	32.43	121.90	20	55	23.3	20	9 32	35.14	111.21	12	39	40.9
21	8 01	34.33	121.64	20	46	48.4	21	9 34	26.35	111.05	12	27	51.8
22	8 03	35.97	121.39	20	38	08.2	22	9 36	17.40	110.88	12	15	59.8
23	8 05	37.36	121.13	20	29	22.9	23	9 38	08.28	110.72	12	04	05.1
24	8 07	38.49		20	20	32.4	24	9 39	59.00	110.72	11	52	07.6
						-530.5							-717.5

MOON, 1935

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Monday, February 18							Wednesday, February 20						
0	h	m	s	+	°	'	0	h	m	s	+	°	'
0	9	39	59.00	110.56	11 52 07.6	-720.1	0	11 06 23.60	106.66	+	1	39 36.3	-795.4
1	9	41	49.56	110.40	11 40 07.5	722.8	1	11 08 10.26	106.67	1	26 20.9	795.9	
2	9	43	39.96	110.25	11 28 04.7	725.4	2	11 09 56.93	106.67	1	13 05.0	796.3	
3	9	45	30.21	110.10	11 15 59.3	728.0	3	11 11 43.60	106.69	0	59 48.7	796.6	
4	9	47	20.31	109.95	11 03 51.3	730.4	4	11 13 30.29	106.69	0	46 32.1	797.1	
5	9	49	10.26	109.81	10 51 40.9	732.9	5	11 15 16.98	106.72	0	33 15.0	797.3	
6	9	51	00.07	109.67	10 39 28.0	735.3	6	11 17 03.70	106.74	0	19 57.7	797.6	
7	9	52	49.74	109.52	10 27 12.7	737.6	7	11 18 50.44	106.76	+	0 06 40.1	797.7	
8	9	54	39.26	109.39	10 14 55.1	740.0	8	11 20 37.20	106.79	-	0 06 37.6	798.0	
9	9	56	28.65	109.26	10 02 35.1	742.3	9	11 22 23.99	106.82	0	19 55.6	798.1	
10	9	58	17.91	109.13	9 50 12.8	744.4	10	11 24 10.81	106.86	0	33 13.7	798.1	
11	10 00	07.04	109.00	9 37 48.4	746.7	11	11 25 57.67	106.90	0	46 31.8	798.2		
12	10 01	56.04	108.88	9 25 21.7	748.8	12	11 27 44.57	106.94	0	59 50.0	798.2		
13	10 03	44.92	108.76	9 12 52.9	750.8	13	11 29 31.51	107.00	1	13 08.2	798.1		
14	10 05	33.68	108.64	9 00 22.1	752.9	14	11 31 18.51	107.04	1	26 26.3	798.0		
15	10 07	22.32	108.53	8 47 49.2	754.9	15	11 33 05.55	107.10	1	39 44.3	797.8		
16	10 09	10.85	108.42	8 35 14.3	756.8	16	11 34 52.65	107.15	1	53 02.1	797.7		
17	10 10	59.27	108.31	8 22 37.5	758.7	17	11 36 39.80	107.22	2	06 19.8	797.5		
18	10 12	47.58	108.20	8 09 58.8	760.6	18	11 38 27.02	107.29	2	19 37.3	797.1		
19	10 14	35.78	108.11	7 57 18.2	762.4	19	11 40 14.31	107.35	2	32 54.4	796.9		
20	10 16	23.89	108.00	7 44 35.8	764.1	20	11 42 01.66	107.43	2	46 11.3	796.4		
21	10 18	11.89	107.92	7 31 51.7	765.9	21	11 43 49.09	107.51	2	59 27.7	796.1		
22	10 19	59.81	107.82	7 19 05.8	767.5	22	11 45 36.60	107.59	3	12 43.8	795.5		
23	10 21	47.63	107.73	+	7 06 18.3	-769.2	23	11 47 24.19	107.67	-	3 25 59.3	-795.1	
Tuesday, February 19							Thursday, February 21						
0	10 23	35.36	107.65	+	6 53 29.1	-770.8	0	11 49 11.86	107.76	-	3 39 14.4	-794.5	
1	10 25	23.01	107.57	6 40 38.3	772.3	1	11 50 59.62	107.86	3	52 28.9	793.9		
2	10 27	10.58	107.50	6 27 46.0	773.7	2	11 52 47.48	107.95	4	05 42.8	793.3		
3	10 28	58.08	107.41	6 14 52.3	775.3	3	11 54 35.43	108.06	4	18 56.1	792.5		
4	10 30	45.49	107.35	6 01 57.0	776.6	4	11 56 23.49	108.15	4	32 08.6	791.9		
5	10 32	32.84	107.28	5 49 00.4	778.0	5	11 58 11.64	108.27	4	45 20.5	791.0		
6	10 34	20.12	107.22	5 36 02.4	779.3	6	11 59 59.91	108.37	4	58 31.5	790.2		
7	10 36	07.34	107.15	5 23 03.1	780.6	7	12 01 48.28	108.50	5	11 41.7	789.4		
8	10 37	54.49	107.10	5 10 02.5	781.8	8	12 03 36.78	108.61	5	24 51.1	788.4		
9	10 39	41.59	107.05	4 57 00.7	783.0	9	12 05 25.39	108.74	5	37 59.5	787.5		
10	10 41	28.64	106.99	4 43 57.7	784.2	10	12 07 14.13	108.86	5	51 07.0	786.4		
11	10 43	15.63	106.95	4 30 53.5	785.2	11	12 09 02.99	108.99	6	04 13.4	785.4		
12	10 45	02.58	106.90	4 17 48.3	786.3	12	12 10 51.98	109.13	6	17 18.8	784.2		
13	10 46	49.48	106.87	4 04 42.0	787.3	13	12 12 41.11	109.26	6	30 23.0	783.1		
14	10 48	36.35	106.83	3 51 34.7	788.3	14	12 14 30.37	109.41	6	43 26.1	781.9		
15	10 50	23.18	106.79	3 38 26.4	789.1	15	12 16 19.78	109.56	6	56 28.0	780.7		
16	10 52	09.97	106.77	3 25 17.3	790.1	16	12 18 09.34	109.71	7	09 28.7	779.3		
17	10 53	56.74	106.74	3 12 07.2	790.8	17	12 19 59.05	109.86	7	22 28.0	777.9		
18	10 55	43.48	106.72	2 58 56.4	791.7	18	12 21 48.91	110.02	7	35 25.9	776.6		
19	10 57	30.20	106.71	2 45 44.7	792.4	19	12 23 38.93	110.18	7	48 22.5	775.1		
20	10 59	16.91	106.68	2 32 32.3	793.0	20	12 25 29.11	110.35	8	01 17.6	773.6		
21	11 01	03.59	106.68	2 19 19.3	793.8	21	12 27 19.46	110.52	8	14 11.2	772.1		
22	11 02	50.27	106.67	2 06 05.5	794.3	22	12 29 09.98	110.69	8	27 03.3	770.5		
23	11 04	36.94	106.66	1 52 51.2	-794.9	23	12 31 00.67	110.87	8	39 53.8	-768.8		
24	11 06	23.60		+	1 39 36.3		24	12 32 51.54		-	8 52 42.6		

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Friday, February 22					Sunday, February 24				
0	h m s	12 32 51.54	III-05	8 52 42.6	0	h m s	14 06 15.19	124-05	18 17 52.9
1		12 34 42.59	III-23	9 05 29.7	1		14 08 19.24	124-39	18 28 13.3
2		12 36 33.82	III-43	9 18 15.1	2		14 10 23.63	124-75	18 38 29.1
3		12 38 25.25	III-62	9 30 58.6	3		14 12 28.38	125-11	18 48 40.3
4		12 40 16.87	III-81	9 43 40.3	4		14 14 33.49	125-46	18 58 46.8
5		12 42 08.68	III-01	9 56 20.2	5		14 16 38.95	125-82	19 08 48.5
6		12 44 00.69	III-22	10 08 58.0	6		14 18 44.77	126-19	19 18 45.4
7		12 45 52.91	III-43	10 21 33.9	7		14 20 50.96	126-54	19 28 37.4
8		12 47 45.34	III-64	10 34 07.7	8		14 22 57.50	126-92	19 38 24.4
9		12 49 37.98	III-86	10 46 39.3	9		14 25 04.42	127-28	19 48 06.4
10		12 51 30.84	III-07	10 59 08.9	10		14 27 11.70	127-66	19 57 43.2
11		12 53 23.91	III-30	11 11 36.2	11		14 29 19.36	128-03	20 07 14.9
12		12 55 17.21	III-53	11 24 01.2	12		14 31 27.39	128-40	20 16 41.3
13		12 57 10.74	III-75	11 36 23.9	13		14 33 35.79	128-78	20 26 02.4
14		12 59 04.49	III-99	11 48 44.2	14		14 35 44.57	129-16	20 35 18.1
15		13 00 58.48	III-23	12 01 02.1	15		14 37 53.73	129-53	20 44 28.3
16		13 02 52.71	III-47	12 13 17.5	16		14 40 03.26	129-92	20 53 32.9
17		13 04 47.18	III-72	12 25 30.4	17		14 42 13.18	130-30	21 02 32.0
18		13 06 41.90	III-96	12 37 40.6	18		14 44 23.48	130-68	21 11 25.3
19		13 08 36.86	III-22	12 49 48.3	19		14 46 34.16	131-07	21 20 12.9
20		13 10 32.08	III-48	13 01 53.2	20		14 48 45.23	131-45	21 28 54.6
21		13 12 27.56	III-73	13 13 55.3	21		14 50 56.68	131-84	21 37 30.5
22		13 14 23.29	III-00	13 25 54.6	22		14 53 08.52	132-23	21 46 00.3
23		13 16 19.29	III-27	13 37 51.1	23		14 55 20.75	132-62	21 54 24.1
Saturday, February 23					Monday, February 25				
0		13 18 15.56	III-54	13 49 44.6	0		14 57 33.37	133-01	22 02 41.8
1		13 20 12.10	III-81	14 01 35.1	1		14 59 46.38	133-39	22 10 53.3
2		13 22 08.91	III-09	14 13 22.6	2		15 01 59.77	133-79	22 18 58.4
3		13 24 06.00	III-38	14 25 07.0	3		15 04 13.56	134-18	22 26 57.2
4		13 26 03.38	III-65	14 36 48.2	4		15 06 27.74	134-57	22 34 49.6
5		13 28 01.03	III-95	14 48 26.2	5		15 08 42.31	134-97	22 42 35.5
6		13 29 58.98	III-24	15 00 00.8	6		15 10 57.28	135-35	22 50 14.8
7		13 31 57.22	III-54	15 11 32.2	7		15 13 12.63	135-74	22 57 47.4
8		13 33 55.76	III-83	15 23 00.1	8		15 15 28.37	136-13	23 05 13.3
9		13 35 54.59	III-14	15 34 24.6	9		15 17 44.50	136-53	23 12 32.4
10		13 37 53.73	III-45	15 45 45.5	10		15 20 01.03	136-91	23 19 44.6
11		13 39 53.18	III-75	15 57 02.9	11		15 22 17.94	137-31	23 26 49.8
12		13 41 52.93	III-06	16 08 16.6	12		15 24 35.25	137-70	23 33 48.0
13		13 43 52.99	III-38	16 19 26.6	13		15 26 52.95	138-08	23 40 39.1
14		13 45 53.37	III-70	16 30 32.8	14		15 29 11.03	138-47	23 47 23.0
15		13 47 54.07	III-02	16 41 35.2	15		15 31 29.50	138-86	23 53 59.6
16		13 49 55.09	III-35	16 52 33.6	16		15 33 48.36	139-24	24 00 28.8
17		13 51 56.44	III-67	17 03 28.1	17		15 36 07.60	139-63	24 06 50.7
18		13 53 58.11	III-00	17 14 18.5	18		15 38 27.23	140-01	24 13 05.1
19		13 56 00.11	III-34	17 25 04.9	19		15 40 47.24	140-39	24 19 11.9
20		13 58 02.45	III-67	17 35 47.1	20		15 43 07.63	140-77	24 25 11.0
21		14 00 05.12	III-02	17 46 25.0	21		15 45 28.40	141-14	24 31 02.5
22		14 02 08.14	III-35	17 56 58.7	22		15 47 49.54	141-52	24 36 46.2
23		14 04 11.49	III-70	18 07 28.0	23		15 50 11.06	141-90	24 42 21.9
24		14 06 15.19		18 17 52.9	24		15 52 32.96		24 47 49.8

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Tuesday, February 26					Thursday, February 28				
0	^h 15 ^m 52 ^s 32.96	^s 142.27	[°] -24 ['] 47 ["] 49.8	["] -319.9	0	^h 17 ^m 52 ^s 03.83	^s 154.61	[°] -26 ['] 13 ["] 07.3	["] +136.2
1	15 54 55.23	142.63	24 53 09.7	311.8	1	17 54 38.44	154.70	26 10 51.1	146.8
2	15 57 17.86	143.00	24 58 21.5	303.6	2	17 57 13.14	154.80	26 08 24.3	157.3
3	15 59 40.86	143.36	25 03 25.1	295.3	3	17 59 47.94	154.88	26 05 47.0	167.8
4	16 02 04.22	143.72	25 08 20.4	287.1	4	18 02 22.82	154.95	26 02 59.2	178.3
5	16 04 27.94	144.08	25 13 07.5	278.7	5	18 04 57.77	155.02	26 00 00.9	188.9
6	16 06 52.02	144.42	25 17 46.2	270.3	6	18 07 32.79	155.08	25 56 52.0	199.5
7	16 09 16.44	144.78	25 22 16.5	261.8	7	18 10 07.87	155.13	25 53 32.5	210.1
8	16 11 41.22	145.13	25 26 38.3	253.1	8	18 12 43.00	155.18	25 50 02.4	220.6
9	16 14 06.35	145.46	25 30 51.4	244.6	9	18 15 18.18	155.22	25 46 21.8	231.1
10	16 16 31.81	145.81	25 34 56.0	235.8	10	18 17 53.40	155.24	25 42 30.7	241.8
11	16 18 57.62	146.14	25 38 51.8	227.0	11	18 20 28.64	155.27	25 38 28.9	252.3
12	16 21 23.76	146.47	25 42 38.8	218.2	12	18 23 03.91	155.29	25 34 16.6	262.9
13	16 23 50.23	146.80	25 46 17.0	209.2	13	18 25 39.20	155.29	25 29 53.7	273.5
14	16 26 17.03	147.12	25 49 46.2	200.2	14	18 28 14.49	155.28	25 25 20.2	284.0
15	16 28 44.15	147.44	25 53 06.4	191.2	15	18 30 49.77	155.28	25 20 36.2	294.5
16	16 31 11.59	147.76	25 56 17.6	182.1	16	18 33 25.05	155.27	25 15 41.7	305.1
17	16 33 39.35	148.06	25 59 19.7	172.9	17	18 36 00.32	155.25	25 10 36.6	315.6
18	16 36 07.41	148.36	26 02 12.6	163.7	18	18 38 35.57	155.21	25 05 21.0	326.0
19	16 38 35.77	148.66	26 04 56.3	154.3	19	18 41 10.78	155.18	24 59 55.0	336.5
20	16 41 04.43	148.95	26 07 30.6	145.0	20	18 43 45.96	155.13	24 54 18.5	347.0
21	16 43 33.38	149.24	26 09 55.6	135.6	21	18 46 21.09	155.09	24 48 31.5	357.4
22	16 46 02.62	149.53	26 12 11.2	126.1	22	18 48 56.18	155.03	24 42 34.1	367.8
23	16 48 32.15	149.80	-26 14 17.3	-116.6	23	18 51 31.21	154.96	-24 36 26.3	+378.2
Wednesday, February 27					Friday, March 1				
0	16 51 01.95	150.07	-26 16 13.9	-107.0	0	18 54 06.17	154.90	-24 30 08.1	+388.5
1	16 53 32.02	150.34	26 18 00.9	97.4	1	18 56 41.07	154.81	24 23 39.6	398.9
2	16 56 02.36	150.60	26 19 38.3	87.6	2	18 59 15.88	154.73	24 17 00.7	409.1
3	16 58 32.96	150.86	26 21 05.9	77.9	3	19 01 50.61	154.64	24 10 11.6	419.4
4	17 01 03.82	151.09	26 22 23.8	68.1	4	19 04 25.25	154.55	24 03 12.2	429.6
5	17 03 34.91	151.34	26 23 31.9	58.3	5	19 06 59.80	154.44	23 56 02.6	439.8
6	17 06 06.25	151.58	26 24 30.2	48.3	6	19 09 34.24	154.33	23 48 42.8	449.9
7	17 08 37.83	151.80	26 25 18.5	38.4	7	19 12 08.57	154.22	23 41 12.9	459.9
8	17 11 09.63	152.02	26 25 56.9	28.5	8	19 14 42.79	154.10	23 33 33.0	470.0
9	17 13 41.65	152.24	26 26 25.4	18.4	9	19 17 16.89	153.98	23 25 43.0	480.0
10	17 16 13.89	152.44	26 26 43.8	8.3	10	19 19 50.87	153.84	23 17 43.0	489.9
11	17 18 46.33	152.65	26 26 52.1	+ 1.8	11	19 22 24.71	153.71	23 09 33.1	499.8
12	17 21 18.98	152.84	26 26 50.3	11.9	12	19 24 58.42	153.57	23 01 13.3	509.7
13	17 23 51.82	153.03	26 26 38.4	22.2	13	19 27 31.99	153.41	22 52 43.6	519.4
14	17 26 24.85	153.21	26 26 16.2	32.4	14	19 30 05.40	153.26	22 44 04.2	529.2
15	17 28 58.06	153.38	26 25 43.8	42.6	15	19 32 38.66	153.11	22 35 15.0	538.8
16	17 31 31.44	153.55	26 25 01.2	52.9	16	19 35 11.77	152.94	22 26 16.2	548.5
17	17 34 04.99	153.70	26 24 08.3	63.3	17	19 37 44.71	152.78	22 17 07.7	558.0
18	17 36 38.69	153.86	26 23 05.0	73.5	18	19 40 17.49	152.61	22 07 49.7	567.4
19	17 39 12.55	154.00	26 21 51.5	84.0	19	19 42 50.10	152.43	21 58 22.3	576.9
20	17 41 46.55	154.13	26 20 27.5	94.4	20	19 45 22.53	152.25	21 48 45.4	586.2
21	17 44 20.68	154.27	26 18 53.1	104.8	21	19 47 54.78	152.07	21 38 59.2	595.4
22	17 46 54.95	154.38	26 17 08.3	115.2	22	19 50 26.85	151.88	21 29 03.8	604.7
23	17 49 29.33	154.50	26 15 13.1	125.8	23	19 52 58.73	151.69	21 18 59.1	613.9
24	17 52 03.83		-26 13 07.3		24	19 55 30.42		-21 08 45.2	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Saturday, March 2			Monday, March 4		
0	19 55 30.42 151.50	-21 08 45.2 +622.9	0	21 52 31.04 140.81	-10 28 10.5 +945.0
1	19 58 01.92 151.29	20 58 22.3 631.9	1	21 54 51.85 140.61	10 12 25.5 949.0
2	20 00 33.21 151.09	20 47 50.4 640.7	2	21 57 12.46 140.42	9 56 36.5 952.9
3	20 03 04.30 150.89	20 37 09.7 649.6	3	21 59 32.88 140.22	9 40 43.6 956.5
4	20 05 35.19 150.68	20 26 20.1 658.4	4	22 01 53.10 140.04	9 24 47.1 960.2
5	20 08 05.87 150.47	20 15 21.7 667.0	5	22 04 13.14 139.85	9 08 46.9 963.7
6	20 10 36.34 150.26	20 04 14.7 675.6	6	22 06 32.99 139.66	8 52 43.2 967.0
7	20 13 06.60 150.05	19 52 59.1 684.1	7	22 08 52.65 139.48	8 36 36.2 970.3
8	20 15 36.65 149.82	19 41 35.0 692.5	8	22 11 12.13 139.31	8 20 25.9 973.4
9	20 18 06.47 149.61	19 30 02.5 700.8	9	22 13 31.44 139.13	8 04 12.5 976.4
10	20 20 36.08 149.38	19 18 21.7 709.1	10	22 15 50.57 138.95	7 47 56.1 979.2
11	20 23 05.46 149.16	19 06 32.6 717.2	11	22 18 09.52 138.79	7 31 36.9 982.1
12	20 25 34.62 148.93	18 54 35.4 725.2	12	22 20 28.31 138.62	7 15 14.8 984.7
13	20 28 03.55 148.71	18 42 30.2 733.2	13	22 22 46.93 138.47	6 58 50.1 987.1
14	20 30 32.26 148.48	18 30 17.0 741.1	14	22 25 05.40 138.30	6 42 23.0 989.5
15	20 33 00.74 148.25	18 17 55.9 748.9	15	22 27 23.70 138.15	6 25 53.5 991.8
16	20 35 28.99 148.01	18 05 27.0 756.5	16	22 29 41.85 138.00	6 09 21.7 993.9
17	20 37 57.00 147.79	17 52 50.5 764.0	17	22 31 59.85 137.85	5 52 47.8 996.0
18	20 40 24.79 147.55	17 40 06.5 771.6	18	22 34 17.70 137.70	5 36 11.8 997.8
19	20 42 52.34 147.32	17 27 14.9 778.9	19	22 36 35.40 137.56	5 19 34.0 999.6
20	20 45 19.66 147.09	17 14 16.0 786.1	20	22 38 52.96 137.43	5 02 54.4 1001.3
21	20 47 46.75 146.85	17 01 09.9 793.4	21	22 41 10.39 137.29	4 46 13.1 1002.7
22	20 50 13.60 146.61	16 47 56.5 800.4	22	22 43 27.68 137.17	4 29 30.4 1004.2
23	20 52 40.21 146.38	-16 34 36.1 +807.4	23	22 45 44.85 137.03	- 4 12 46.2 +1005.5
Sunday, March 3			Tuesday, March 5		
0	20 55 06.59 146.15	-16 21 08.7 +814.2	0	22 48 01.88 136.91	- 3 56 00.7 +1006.6
1	20 57 32.74 145.91	16 07 34.5 821.0	1	22 50 18.79 136.80	3 39 14.1 1007.7
2	20 59 58.65 145.68	15 53 53.5 827.6	2	22 52 35.59 136.68	3 22 26.4 1008.5
3	21 02 24.33 145.44	15 40 05.9 834.2	3	22 54 52.27 136.57	3 05 37.9 1009.4
4	21 04 49.77 145.21	15 26 11.7 840.6	4	22 57 08.84 136.47	2 48 48.5 1010.0
5	21 07 14.98 144.98	15 12 11.1 846.8	5	22 59 25.31 136.36	2 31 58.5 1010.6
6	21 09 39.96 144.74	14 58 04.3 853.1	6	23 01 41.67 136.26	2 15 07.9 1011.0
7	21 12 04.70 144.51	14 43 51.2 859.2	7	23 03 57.93 136.17	1 58 16.9 1011.3
8	21 14 29.21 144.29	14 29 32.0 865.1	8	23 06 14.10 136.07	1 41 25.6 1011.5
9	21 16 53.50 144.05	14 15 06.9 871.1	9	23 08 30.17 135.99	1 24 34.1 1011.5
10	21 19 17.55 143.82	14 00 35.8 876.8	10	23 10 46.16 135.90	1 07 42.6 1011.5
11	21 21 41.37 143.60	13 45 59.0 882.4	11	23 13 02.06 135.82	0 50 51.1 1011.3
12	21 24 04.97 143.37	13 31 16.6 887.9	12	23 15 17.88 135.74	0 33 59.8 1011.0
13	21 26 28.34 143.15	13 16 28.7 893.4	13	23 17 33.62 135.68	0 17 08.8 1010.6
14	21 28 51.49 142.92	13 01 35.3 898.6	14	23 19 49.30 135.60	- 0 00 18.2 1010.1
15	21 31 14.41 142.71	12 46 36.7 903.8	15	23 22 04.90 135.55	+ 0 16 31.9 1009.5
16	21 33 37.12 142.48	12 31 32.9 908.9	16	23 24 20.45 135.48	0 33 21.4 1008.7
17	21 35 59.60 142.27	12 16 24.0 913.8	17	23 26 35.93 135.42	0 50 10.1 1007.8
18	21 38 21.87 142.05	12 01 10.2 918.6	18	23 28 51.35 135.38	1 06 57.9 1006.8
19	21 40 43.92 141.84	11 45 51.6 923.3	19	23 31 06.73 135.32	1 23 44.7 1005.7
20	21 43 05.76 141.63	11 30 28.3 927.9	20	23 33 22.05 135.28	1 40 30.4 1004.5
21	21 45 27.39 141.42	11 15 00.4 932.3	21	23 35 37.33 135.24	1 57 14.9 1003.1
22	21 47 48.81 141.22	10 59 28.1 936.7	22	23 37 52.57 135.20	2 13 58.0 1001.7
23	21 50 10.03 141.01	10 43 51.4 +940.9	23	23 40 07.77 135.17	2 30 39.7 +1000.1
24	21 52 31.04	-10 28 10.5	24	23 42 22.94	+ 2 47 19.8

MOON, 1935

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Wednesday, March 6					Friday, March 8				
0	^h 23 ^m 42 ^s 22.94	^s 135.14	[°] + 2 ['] 47 ["] 19.8	^s +998.5	0	^h 1 ^m 30 ^s 59.11	^s 137.49	[°] + 15 ['] 02 ["] 24.0	^s +798.6
1	23 44 38.08	135.11	3 03 58.3	996.6	1	1 33 16.60	137.49	15 15 42.6	+798.6
2	23 46 53.19	135.09	3 20 34.9	994.8	2	1 35 34.19	137.59	15 28 54.8	792.2
3	23 49 08.28	135.08	3 37 09.7	992.7	3	1 37 51.89	137.70	15 42 00.6	785.8
4	23 51 23.36	135.06	3 53 42.4	990.6	4	1 40 09.70	137.81	15 54 59.9	779.3
5	23 53 38.42	135.04	4 10 13.0	988.4	5	1 42 27.62	137.92	16 07 52.7	772.8
6	23 55 53.46	135.04	4 26 41.4	986.0	6	1 44 45.64	138.02	16 20 38.9	766.2
7	23 58 08.50	135.04	4 43 07.4	983.6	7	1 47 03.77	138.13	16 33 18.5	759.6
8	0 00 23.54	135.04	4 59 31.0	981.0	8	1 49 22.02	138.25	16 45 51.2	752.7
9	0 02 38.58	135.05	5 15 52.0	978.4	9	1 51 40.37	138.35	16 58 17.2	746.0
10	0 04 53.63	135.05	5 32 10.4	975.5	10	1 53 58.84	138.47	17 10 36.2	739.0
11	0 07 08.68	135.06	5 48 25.9	972.7	11	1 56 17.41	138.57	17 22 48.3	732.1
12	0 09 23.74	135.08	6 04 38.6	969.7	12	1 58 36.10	138.69	17 34 53.4	725.1
13	0 11 38.82	135.09	6 20 48.3	966.6	13	2 00 54.90	138.80	17 46 51.4	718.0
14	0 13 53.91	135.11	6 36 54.9	963.4	14	2 03 13.81	138.91	17 58 42.3	710.9
15	0 16 09.02	135.14	6 52 58.3	960.1	15	2 05 32.83	139.02	18 10 25.9	703.6
16	0 18 24.16	135.17	7 08 58.4	956.7	16	2 07 51.97	139.14	18 22 02.3	696.4
17	0 20 39.33	135.20	7 24 55.1	953.3	17	2 10 11.22	139.25	18 33 31.4	689.1
18	0 22 54.53	135.23	7 40 48.4	949.6	18	2 12 30.57	139.35	18 44 53.0	681.6
19	0 25 09.76	135.28	7 56 38.0	945.9	19	2 14 50.04	139.47	18 56 07.3	674.3
20	0 27 25.04	135.31	8 12 23.9	942.1	20	2 17 09.62	139.58	19 07 14.0	666.7
21	0 29 40.35	135.35	8 28 06.0	938.2	21	2 19 29.31	139.69	19 18 13.2	659.2
22	0 31 55.70	135.41	8 43 44.2	934.2	22	2 21 49.10	139.79	19 29 04.8	651.6
23	0 34 11.11	135.45	+ 8 59 18.4	+930.1	23	2 24 09.01	139.91	+ 19 39 48.7	+643.9
Thursday, March 7					Saturday, March 9				
0	0 36 26.56	135.50	+ 9 14 48.5	+925.9	0	2 26 29.02	140.12	+ 19 50 24.9	+628.5
1	0 38 42.06	135.56	9 30 14.4	921.7	1	2 28 49.14	140.22	20 00 53.4	620.6
2	0 40 57.62	135.62	9 45 36.1	917.2	2	2 31 09.36	140.33	20 11 14.0	612.8
3	0 43 13.24	135.69	10 00 53.3	912.8	3	2 33 29.69	140.43	20 21 26.8	604.8
4	0 45 28.93	135.74	10 16 06.1	908.1	4	2 35 50.12	140.54	20 31 31.6	596.9
5	0 47 44.67	135.81	10 31 14.2	903.5	5	2 38 10.66	140.63	20 41 28.5	588.9
6	0 50 00.48	135.88	10 46 17.7	898.8	6	2 40 31.29	140.73	20 51 17.4	580.8
7	0 52 16.36	135.95	11 01 16.5	894.0	7	2 42 52.02	140.83	21 00 58.2	572.8
8	0 54 32.31	136.03	11 16 10.5	889.0	8	2 45 12.85	140.92	21 10 31.0	564.6
9	0 56 48.34	136.10	11 30 59.5	884.0	9	2 47 33.77	141.02	21 19 55.6	556.4
10	0 59 04.44	136.19	11 45 43.5	878.8	10	2 49 54.79	141.10	21 29 12.0	548.2
11	1 01 20.63	136.26	12 00 22.3	873.7	11	2 52 15.80	141.20	21 38 20.2	540.0
12	1 03 36.89	136.35	12 14 56.0	868.4	12	2 54 37.09	141.28	21 47 20.2	531.7
13	1 05 53.24	136.43	12 29 24.4	863.0	13	2 56 58.37	141.37	21 56 11.9	523.3
14	1 08 09.67	136.52	12 43 47.4	857.6	14	2 59 19.74	141.45	22 04 55.2	515.0
15	1 10 26.19	136.61	12 58 05.0	852.0	15	3 01 41.19	141.53	22 13 30.2	506.6
16	1 12 42.80	136.70	13 12 17.0	846.4	16	3 04 02.72	141.61	22 21 56.8	498.1
17	1 14 59.50	136.79	13 26 23.4	840.7	17	3 06 24.33	141.69	22 30 14.9	489.7
18	1 17 16.29	136.89	13 40 24.1	834.9	18	3 08 46.02	141.75	22 38 24.6	481.2
19	1 19 33.18	136.99	13 54 19.0	829.0	19	3 11 07.77	141.83	22 46 25.8	472.6
20	1 21 50.17	137.08	14 08 08.0	823.1	20	3 13 29.60	141.89	22 54 18.4	464.1
21	1 24 07.25	137.19	14 21 51.1	817.1	21	3 15 51.49	141.95	23 02 02.5	455.5
22	1 26 24.44	137.28	14 35 28.2	811.0	22	3 18 13.44	142.02	23 09 38.0	446.9
23	1 28 41.72	137.39	14 48 59.2	+804.8	23	3 20 35.46	142.07	23 17 04.9	+438.2
24	1 30 59.11		+ 15 02 24.0		24	3 22 57.53		+ 23 24 23.1	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Sunday, March 10			Tuesday, March 12		
0	h m s 3 22 57.53	+23 24 23.1	0	h m s 5 16 29.26	+26 22 03.1
1	3 25 19.66	+23 31 32.7	1	5 18 49.25	26 22 10.3
2	3 27 41.84	23 38 33.6	2	5 21 09.08	26 22 09.0
3	3 30 04.07	23 45 25.7	3	5 23 28.76	26 21 59.2
4	3 32 26.34	23 52 09.2	4	5 25 48.27	26 21 40.9
5	3 34 48.65	23 58 43.9	5	5 28 07.62	26 21 14.2
6	3 37 11.00	24 05 09.8	6	5 30 26.81	26 20 39.2
7	3 39 33.39	24 11 27.0	7	5 32 45.82	26 19 55.8
8	3 41 55.80	24 17 35.3	8	5 35 04.65	26 19 04.1
9	3 44 18.24	24 23 34.9	9	5 37 23.31	26 18 04.1
10	3 46 40.71	24 29 25.6	10	5 39 41.77	26 16 55.9
11	3 49 03.19	24 35 07.4	11	5 42 00.05	26 15 39.4
12	3 51 25.69	24 40 40.4	12	5 44 18.14	26 14 14.8
13	3 53 48.20	24 46 04.6	13	5 46 36.03	26 12 42.0
14	3 56 10.71	24 51 19.8	14	5 48 53.72	26 11 01.1
15	3 58 33.23	24 56 26.2	15	5 51 11.21	26 09 12.2
16	4 00 55.75	25 01 23.7	16	5 53 28.50	26 07 15.1
17	4 03 18.26	25 06 12.3	17	5 55 45.57	26 05 10.1
18	4 05 40.77	25 10 52.0	18	5 58 02.43	26 02 57.2
19	4 08 03.26	25 15 22.7	19	6 00 19.08	26 00 36.3
20	4 10 25.73	25 19 44.6	20	6 02 35.50	25 58 07.5
21	4 12 48.17	25 23 57.6	21	6 04 51.71	25 55 30.9
22	4 15 10.59	25 28 01.6	22	6 07 07.69	25 52 46.5
23	4 17 32.98	+25 31 56.8	23	6 09 23.44	+25 49 54.4
	142-35	+226.2		135-52	-179.9
Monday, March 11			Wednesday, March 13		
0	4 19 55.33	+25 35 43.0	0	6 11 38.96	+25 46 54.5
1	4 22 17.64	25 39 20.3	1	6 13 54.25	25 43 47.0
2	4 24 39.91	25 42 48.7	2	6 16 09.29	25 40 31.9
3	4 27 02.12	25 46 08.2	3	6 18 24.10	25 37 09.1
4	4 29 24.29	25 49 18.8	4	6 20 38.67	25 33 38.9
5	4 31 46.39	25 52 20.6	5	6 22 52.99	25 30 01.1
6	4 34 08.44	25 55 13.5	6	6 25 07.07	25 26 15.9
7	4 36 30.41	25 57 57.5	7	6 27 20.90	25 22 23.3
8	4 38 52.32	26 00 32.6	8	6 29 34.48	25 18 23.3
9	4 41 14.14	26 02 58.9	9	6 31 47.80	25 14 16.0
10	4 43 35.89	26 05 16.4	10	6 34 00.87	25 10 01.5
11	4 45 57.55	26 07 25.1	11	6 36 13.68	25 05 39.7
12	4 48 19.12	26 09 24.9	12	6 38 26.23	25 01 10.8
13	4 50 40.60	26 11 16.0	13	6 40 38.51	24 56 34.7
14	4 53 01.97	26 12 58.3	14	6 42 50.54	24 51 51.6
15	4 55 23.24	26 14 31.8	15	6 45 02.30	24 47 01.5
16	4 57 44.40	26 15 56.6	16	6 47 13.79	24 42 04.4
17	5 00 05.45	26 17 12.7	17	6 49 25.02	24 37 00.3
18	5 02 26.38	26 18 20.1	18	6 51 35.98	24 31 49.4
19	5 04 47.19	26 19 18.8	19	6 53 46.67	24 26 31.6
20	5 07 07.88	26 20 08.9	20	6 55 57.09	24 21 07.0
21	5 09 28.43	26 20 50.3	21	6 58 07.24	24 15 35.7
22	5 11 48.85	26 21 23.2	22	7 00 17.11	24 09 57.7
23	5 14 09.13	26 21 47.4	23	7 02 26.71	24 04 13.1
24	5 16 29.26	+26 22 03.1	24	7 04 36.04	+23 58 21.9
	140-13	+15.7		129-33	-351.2

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Thursday, March 14			Saturday, March 16		
0	^h 7 ^m 04 ^s 36.04 [°] 129.05 ['] 23 [°] 58 ['] 21.9 [°] -357.7		0	^h 8 ^m 42 ^s 41.89 [°] 116.31 ['] 17 [°] 24 ['] 55.1 [°] -611.9	
1	7 06 45.09 [°] 128.77 ['] 23 52 24.2 [°] -357.7		1	8 44 38.20 [°] 116.09 ['] 17 14 43.2 [°] -615.9	
2	7 08 53.86 [°] 128.49 ['] 23 46 20.0 [°] 370.7		2	8 46 34.29 [°] 115.86 ['] 17 04 27.3 [°] 619.9	
3	7 11 02.35 [°] 128.22 ['] 23 40 09.3 [°] 377.0		3	8 48 30.15 [°] 115.63 ['] 16 54 07.4 [°] 623.9	
4	7 13 10.57 [°] 127.94 ['] 23 33 52.3 [°] 383.4		4	8 50 25.78 [°] 115.41 ['] 16 43 43.5 [°] 627.9	
5	7 15 18.51 [°] 127.65 ['] 23 27 28.9 [°] 389.6		5	8 52 21.19 [°] 115.20 ['] 16 33 15.6 [°] 631.7	
6	7 17 26.16 [°] 127.38 ['] 23 20 59.3 [°] 395.9		6	8 54 16.39 [°] 114.97 ['] 16 22 43.9 [°] 635.6	
7	7 19 33.54 [°] 127.11 ['] 23 14 23.4 [°] 402.1		7	8 56 11.36 [°] 114.76 ['] 16 12 08.3 [°] 639.4	
8	7 21 40.65 [°] 126.82 ['] 23 07 41.3 [°] 408.2		8	8 58 06.12 [°] 114.55 ['] 16 01 28.9 [°] 643.1	
9	7 23 47.47 [°] 126.54 ['] 23 00 53.1 [°] 414.2		9	9 00 00.67 [°] 114.34 ['] 15 50 45.8 [°] 646.8	
10	7 25 54.01 [°] 126.26 ['] 22 53 58.9 [°] 420.3		10	9 01 55.01 [°] 114.13 ['] 15 39 59.0 [°] 650.4	
11	7 28 00.27 [°] 125.98 ['] 22 46 58.6 [°] 426.3		11	9 03 49.14 [°] 113.92 ['] 15 29 08.6 [°] 654.1	
12	7 30 06.25 [°] 125.70 ['] 22 39 52.3 [°] 432.2		12	9 05 43.06 [°] 113.72 ['] 15 18 14.5 [°] 657.6	
13	7 32 11.95 [°] 125.43 ['] 22 32 40.1 [°] 438.0		13	9 07 36.78 [°] 113.53 ['] 15 07 16.9 [°] 661.1	
14	7 34 17.38 [°] 125.14 ['] 22 25 22.1 [°] 443.9		14	9 09 30.31 [°] 113.34 ['] 14 56 15.8 [°] 664.6	
15	7 36 22.52 [°] 124.87 ['] 22 17 58.2 [°] 449.7		15	9 11 23.63 [°] 113.14 ['] 14 45 11.2 [°] 668.0	
16	7 38 27.39 [°] 124.58 ['] 22 10 28.5 [°] 455.4		16	9 13 16.77 [°] 112.94 ['] 14 34 03.2 [°] 671.4	
17	7 40 31.97 [°] 124.31 ['] 22 02 53.1 [°] 461.0		17	9 15 09.71 [°] 112.75 ['] 14 22 51.8 [°] 674.7	
18	7 42 36.28 [°] 124.04 ['] 21 55 12.1 [°] 466.7		18	9 17 02.46 [°] 112.57 ['] 14 11 37.1 [°] 678.0	
19	7 44 40.32 [°] 123.76 ['] 21 47 25.4 [°] 472.2		19	9 18 55.03 [°] 112.39 ['] 14 00 19.1 [°] 681.3	
20	7 46 44.08 [°] 123.48 ['] 21 39 33.2 [°] 477.8		20	9 20 47.42 [°] 112.20 ['] 13 48 57.8 [°] 684.4	
21	7 48 47.56 [°] 123.21 ['] 21 31 35.4 [°] 483.2		21	9 22 39.62 [°] 112.03 ['] 13 37 33.4 [°] 687.5	
22	7 50 50.77 [°] 122.94 ['] 21 23 32.2 [°] 488.6		22	9 24 31.65 [°] 111.86 ['] 13 26 05.9 [°] 690.7	
23	7 52 53.71 [°] 122.66 ['] 21 15 23.6 [°] -494.0		23	9 26 23.51 [°] 111.68 ['] 13 14 35.2 [°] -693.7	
Friday, March 15			Sunday, March 17		
0	7 54 56.37 [°] 122.39 ['] 21 07 09.6 [°] -499.3		0	9 28 15.19 [°] 111.52 ['] 13 03 01.5 [°] -696.7	
1	7 56 58.76 [°] 122.12 ['] 20 58 50.3 [°] 504.6		1	9 30 06.71 [°] 111.35 ['] 12 51 24.8 [°] 699.7	
2	7 59 00.88 [°] 121.85 ['] 20 50 25.7 [°] 509.8		2	9 31 58.06 [°] 111.19 ['] 12 39 45.1 [°] 702.6	
3	8 01 02.73 [°] 121.58 ['] 20 41 55.9 [°] 514.9		3	9 33 49.25 [°] 111.03 ['] 12 28 02.5 [°] 705.4	
4	8 03 04.31 [°] 121.32 ['] 20 33 21.0 [°] 520.0		4	9 35 40.28 [°] 110.87 ['] 12 16 17.1 [°] 708.3	
5	8 05 05.63 [°] 121.05 ['] 20 24 41.0 [°] 525.1		5	9 37 31.15 [°] 110.72 ['] 12 04 28.8 [°] 711.0	
6	8 07 06.68 [°] 120.78 ['] 20 15 55.9 [°] 530.2		6	9 39 21.87 [°] 110.57 ['] 11 52 37.8 [°] 713.8	
7	8 09 07.46 [°] 120.52 ['] 20 07 05.7 [°] 535.0		7	9 41 12.44 [°] 110.42 ['] 11 40 44.0 [°] 716.5	
8	8 11 07.98 [°] 120.26 ['] 19 58 10.7 [°] 540.0		8	9 43 02.86 [°] 110.28 ['] 11 28 47.5 [°] 719.1	
9	8 13 08.24 [°] 120.00 ['] 19 49 10.7 [°] 544.9		9	9 44 53.14 [°] 110.14 ['] 11 16 48.4 [°] 721.8	
10	8 15 08.24 [°] 119.75 ['] 19 40 05.8 [°] 549.7		10	9 46 43.28 [°] 110.00 ['] 11 04 46.6 [°] 724.3	
11	8 17 07.99 [°] 119.48 ['] 19 30 56.1 [°] 554.4		11	9 48 33.28 [°] 109.87 ['] 10 52 42.3 [°] 726.8	
12	8 19 07.47 [°] 119.23 ['] 19 21 41.7 [°] 559.1		12	9 50 23.15 [°] 109.74 ['] 10 40 35.5 [°] 729.3	
13	8 21 06.70 [°] 118.98 ['] 19 12 22.6 [°] 563.8		13	9 52 12.89 [°] 109.60 ['] 10 28 26.2 [°] 731.7	
14	8 23 05.68 [°] 118.72 ['] 18 53 30.3 [°] 568.5		14	9 54 02.49 [°] 109.49 ['] 10 16 14.5 [°] 734.1	
15	8 25 04.40 [°] 118.47 ['] 18 43 57.4 [°] 572.9		15	9 55 51.98 [°] 109.36 ['] 10 04 00.4 [°] 736.4	
16	8 27 02.87 [°] 118.23 ['] 18 34 19.9 [°] 577.5		16	9 57 41.34 [°] 109.24 ['] 9 51 44.0 [°] 738.8	
17	8 29 01.10 [°] 117.97 ['] 18 24 37.9 [°] 582.0		17	9 59 30.58 [°] 109.13 ['] 9 39 25.2 [°] 740.9	
18	8 30 59.07 [°] 117.74 ['] 18 14 51.5 [°] 586.4		18	10 01 19.71 [°] 109.02 ['] 9 27 04.3 [°] 743.2	
19	8 32 56.81 [°] 117.49 ['] 18 05 00.8 [°] 590.7		19	10 03 08.73 [°] 108.91 ['] 9 14 41.1 [°] 745.4	
20	8 34 54.30 [°] 117.25 ['] 17 55 05.7 [°] 595.1		20	10 04 57.64 [°] 108.80 ['] 9 02 15.7 [°] 747.5	
21	8 36 51.55 [°] 117.02 ['] 17 45 06.4 [°] 599.3		21	10 06 46.44 [°] 108.60 ['] 8 49 48.2 [°] 749.5	
22	8 38 48.57 [°] 116.78 ['] 17 35 02.8 [°] 603.6		22	10 08 35.14 [°] 108.51 ['] 8 37 18.7 [°] 751.6	
23	8 40 45.35 [°] 116.54 ['] 17 24 55.1 [°] -607.7		23	10 10 23.74 [°] 108.42 ['] 8 24 47.1 [°] -753.6	
24	8 42 41.89 [°] 116.30 ['] 17 14 43.2 [°] -611.9		24	10 12 12.25 [°] 108.33 ['] 8 12 13.5 [°] -615.9	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Monday, March 18					Wednesday, March 20				
0	10 12 12.25	108.42	+ 8 12 13.5	-755.5	0	11 38 15.90	108.09	- 2 15 15.7	-796.9
1	10 14 00.67	108.32	7 59 38.0	-757.4	1	11 40 03.99	108.16	2 28 32.6	796.7
2	10 15 48.99	108.24	7 47 00.6	759.3	2	11 41 52.15	108.25	2 41 49.3	796.4
3	10 17 37.23	108.16	7 34 21.3	761.1	3	11 43 40.40	108.34	2 55 05.7	796.1
4	10 19 25.39	108.08	7 21 40.2	762.8	4	11 45 28.74	108.43	3 08 21.8	795.7
5	10 21 13.47	108.00	7 08 57.4	764.6	5	11 47 17.17	108.53	3 21 37.5	795.2
6	10 23 01.47	107.94	6 56 12.8	766.2	6	11 49 05.70	108.62	3 34 52.7	794.7
7	10 24 49.41	107.86	6 43 26.6	768.0	7	11 50 54.32	108.72	3 48 07.4	794.2
8	10 26 37.27	107.80	6 30 38.6	769.5	8	11 52 43.04	108.83	4 01 21.6	793.7
9	10 28 25.07	107.74	6 17 49.1	771.0	9	11 54 31.87	108.94	4 14 35.3	792.9
10	10 30 12.81	107.68	6 04 58.1	772.6	10	11 56 20.81	109.06	4 27 48.2	792.3
11	10 32 00.49	107.62	5 52 05.5	774.0	11	11 58 09.87	109.17	4 41 00.5	791.6
12	10 33 48.11	107.58	5 39 11.5	775.4	12	11 59 59.04	109.29	4 54 12.1	790.8
13	10 35 35.69	107.52	5 26 16.1	776.9	13	12 01 48.33	109.42	5 07 22.9	789.9
14	10 37 23.21	107.49	5 13 19.2	778.1	14	12 03 37.75	109.54	5 20 32.8	789.0
15	10 39 10.70	107.44	5 00 21.1	779.5	15	12 05 27.29	109.67	5 33 41.8	788.2
16	10 40 58.14	107.40	4 47 21.6	780.7	16	12 07 16.96	109.81	5 46 50.0	787.1
17	10 42 45.54	107.37	4 34 20.9	781.8	17	12 09 06.77	109.95	5 59 57.1	786.1
18	10 44 32.91	107.35	4 21 19.1	783.1	18	12 10 56.72	110.09	6 13 03.2	785.0
19	10 46 20.26	107.31	4 08 16.0	784.1	19	12 12 46.81	110.23	6 26 08.2	783.9
20	10 48 07.57	107.29	3 55 11.9	785.2	20	12 14 37.04	110.39	6 39 12.1	782.7
21	10 49 54.86	107.27	3 42 06.7	786.3	21	12 16 27.43	110.54	6 52 14.8	781.4
22	10 51 42.13	107.26	3 29 00.4	787.2	22	12 18 17.97	110.69	7 05 16.2	780.2
23	10 53 29.39	107.24	+ 3 15 53.2	-788.2	23	12 20 08.66	110.85	- 7 18 16.4	-778.8
Tuesday, March 19					Thursday, March 21				
0	10 55 16.63	107.23	+ 3 02 45.0	-789.0	0	12 21 59.51	111.02	- 7 31 15.2	-777.4
1	10 57 03.86	107.23	2 49 36.0	789.9	1	12 23 50.53	111.18	7 44 12.6	775.9
2	10 58 51.09	107.22	2 36 26.1	790.8	2	12 25 41.71	111.35	7 57 08.5	774.4
3	11 00 38.31	107.22	2 23 15.3	791.4	3	12 27 33.06	111.53	8 10 02.9	772.9
4	11 02 25.54	107.24	2 10 03.9	792.2	4	12 29 24.59	111.70	8 22 55.8	771.3
5	11 04 12.78	107.24	1 56 51.7	792.9	5	12 31 16.29	111.89	8 35 47.1	769.6
6	11 06 00.02	107.25	1 43 38.8	793.5	6	12 33 08.18	112.07	8 48 36.7	767.9
7	11 07 47.27	107.27	1 30 25.3	794.1	7	12 35 00.25	112.25	9 01 24.6	766.2
8	11 09 34.54	107.29	1 17 11.2	794.6	8	12 36 52.50	112.45	9 14 10.8	764.2
9	11 11 21.83	107.31	1 03 56.6	795.0	9	12 38 44.95	112.65	9 26 55.0	762.4
10	11 13 09.14	107.33	0 50 41.6	795.6	10	12 40 37.60	112.84	9 39 37.4	760.5
11	11 14 56.47	107.37	0 37 26.0	795.9	11	12 42 30.44	113.04	9 52 17.9	758.5
12	11 16 43.84	107.40	0 24 10.1	796.3	12	12 44 23.48	113.25	10 04 56.4	756.4
13	11 18 31.24	107.44	+ 0 10 53.8	796.6	13	12 46 16.73	113.46	10 17 32.8	754.4
14	11 20 18.68	107.48	- 0 02 22.8	796.8	14	12 48 10.19	113.67	10 30 07.2	752.1
15	11 22 06.16	107.52	0 15 39.6	797.1	15	12 50 03.86	113.88	10 42 39.3	750.0
16	11 23 53.68	107.57	0 28 56.7	797.3	16	12 51 57.74	114.11	10 55 09.3	747.7
17	11 25 41.25	107.63	0 42 14.0	797.4	17	12 53 51.85	114.32	11 07 37.0	745.3
18	11 27 28.88	107.67	0 55 31.4	797.4	18	12 55 46.17	114.56	11 20 02.3	743.0
19	11 29 16.55	107.74	1 08 48.8	797.5	19	12 57 40.73	114.78	11 32 25.3	740.5
20	11 31 04.29	107.80	1 22 06.3	797.5	20	12 59 35.51	115.01	11 44 45.8	738.1
21	11 32 52.09	107.87	1 35 23.8	797.4	21	13 01 30.52	115.25	11 57 03.9	735.4
22	11 34 39.96	107.93	1 48 41.2	797.3	22	13 03 25.77	115.48	12 09 19.3	732.8
23	11 36 27.89	108.01	2 01 58.5	-797.2	23	13 05 21.25	115.73	12 21 32.1	-730.2
24	11 38 15.90		- 2 15 15.7		24	13 07 16.98		-12 33 42.3	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Friday, March 22			Sunday, March 24		
0	13 07 16.98 115.97	-12 33 42.3	0	14 45 30.33 130.70	-21 04 48.1
1	13 09 12.95 116.22	12 45 49.7	1	14 47 41.03 131.04	21 13 28.7
2	13 11 09.17 116.48	12 57 54.3	2	14 49 52.07 131.39	21 22 03.4
3	13 13 05.65 116.72	13 09 56.1	3	14 52 03.46 131.74	21 30 32.1
4	13 15 02.37 116.99	13 21 54.9	4	14 54 15.20 132.09	21 38 54.6
5	13 16 59.36 117.24	13 33 50.8	5	14 56 27.29 132.43	21 47 11.0
6	13 18 56.60 117.51	13 45 43.6	6	14 58 39.72 132.77	21 55 21.1
7	13 20 54.11 117.78	13 57 33.3	7	15 00 52.49 133.12	22 03 24.9
8	13 22 51.89 118.04	14 09 19.8	8	15 03 05.61 133.47	22 11 22.3
9	13 24 49.93 118.32	14 21 03.1	9	15 05 19.08 133.81	22 19 13.3
10	13 26 48.25 118.59	14 32 43.1	10	15 07 32.89 134.15	22 26 57.7
11	13 28 46.84 118.87	14 44 19.8	11	15 09 47.04 134.50	22 34 35.5
12	13 30 45.71 119.15	14 55 53.1	12	15 12 01.54 134.84	22 42 06.7
13	13 32 44.86 119.43	15 07 22.9	13	15 14 16.38 135.19	22 49 31.1
14	13 34 44.29 119.72	15 18 49.2	14	15 16 31.57 135.52	22 56 48.8
15	13 36 44.01 120.01	15 30 11.8	15	15 18 47.09 135.86	23 03 59.5
16	13 38 44.02 120.30	15 41 30.8	16	15 21 02.95 136.21	23 11 03.3
17	13 40 44.32 120.60	15 52 46.1	17	15 23 19.16 136.54	23 18 00.1
18	13 42 44.92 120.89	16 03 57.5	18	15 25 35.70 136.87	23 24 49.9
19	13 44 45.81 121.19	16 15 05.1	19	15 27 52.57 137.21	23 31 32.4
20	13 46 47.00 121.49	16 26 08.8	20	15 30 09.78 137.54	23 38 07.8
21	13 48 48.49 121.80	16 37 08.5	21	15 32 27.32 137.88	23 44 35.9
22	13 50 50.29 122.11	16 48 04.2	22	15 34 45.20 138.20	23 50 56.7
23	13 52 52.40 122.41	-16 58 55.7	23	15 37 03.40 138.53	-23 57 10.0
		-647.3			-365.9
Saturday, March 23			Monday, March 25		
0	13 54 54.81 122.72	-17 09 43.0	0	15 39 21.93 138.86	-24 03 15.9
1	13 56 57.53 123.04	17 20 26.1	1	15 41 40.79 139.17	24 09 14.2
2	13 59 00.57 123.35	17 31 04.9	2	15 43 59.96 139.50	24 15 05.0
3	14 01 03.92 123.68	17 41 39.3	3	15 46 19.46 139.82	24 20 48.0
4	14 03 07.60 123.99	17 52 09.2	4	15 48 39.28 140.13	24 26 23.3
5	14 05 11.59 124.31	18 02 34.6	5	15 50 59.41 140.45	24 31 50.8
6	14 07 15.90 124.64	18 12 55.4	6	15 53 19.86 140.75	24 37 10.4
7	14 09 20.54 124.96	18 23 11.6	7	15 55 40.61 141.06	24 42 22.1
8	14 11 25.50 125.29	18 33 23.0	8	15 58 01.67 141.36	24 47 25.8
9	14 13 30.79 125.61	18 43 29.7	9	16 00 23.03 141.66	24 52 21.4
10	14 15 36.40 125.95	18 53 31.4	10	16 02 44.69 141.97	24 57 09.0
11	14 17 42.35 126.28	19 03 28.3	11	16 05 06.66 142.25	25 01 48.4
12	14 19 48.63 126.61	19 13 20.2	12	16 07 28.91 142.54	25 06 19.5
13	14 21 55.24 126.95	19 23 07.0	13	16 09 51.45 142.84	25 10 42.4
14	14 24 02.19 127.28	19 32 48.7	14	16 12 14.29 143.11	25 14 56.9
15	14 26 09.47 127.62	19 42 25.2	15	16 14 37.40 143.39	25 19 03.0
16	14 28 17.09 127.97	19 51 56.4	16	16 17 00.79 143.67	25 23 00.6
17	14 30 25.06 128.30	20 01 22.3	17	16 19 24.46 143.94	25 26 49.7
18	14 32 33.36 128.64	20 10 42.8	18	16 21 48.40 144.20	25 30 30.2
19	14 34 42.00 128.98	20 19 57.8	19	16 24 12.60 144.47	25 34 02.1
20	14 36 50.98 129.32	20 29 07.2	20	16 26 37.07 144.72	25 37 25.3
21	14 39 00.30 129.67	20 38 11.0	21	16 29 01.79 144.97	25 40 39.8
22	14 41 09.97 130.01	20 47 09.2	22	16 31 26.76 145.22	25 43 45.5
23	14 43 19.98 130.35	20 56 01.5	23	16 33 51.98 145.47	25 46 42.4
24	14 45 30.33	-21 04 48.1	24	16 36 17.45	-25 49 30.4
		-526.6			-168.0

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Tuesday, March 26			Thursday, March 28		
0	^h 16 ^m 36 ^s 17.45 145.71	[°] 25 ['] 49 ["] 30.4 -159.1	0	^h 18 ^m 35 ^s 33.91 150.20	[°] 24 ['] 58 ["] 33.5 +302.2
1	16 38 43.16 145.93	25 52 09.5 150.0	1	18 38 04.11 150.13	24 53 31.3 311.9
2	16 41 09.09 146.17	25 54 39.5 141.1	2	18 40 34.24 150.08	24 48 19.4 321.5
3	16 43 35.26 146.39	25 57 00.6 131.9	3	18 43 04.32 150.00	24 42 57.9 331.3
4	16 46 01.65 146.61	25 59 12.5 122.9	4	18 45 34.32 149.93	24 37 26.6 340.8
5	16 48 28.26 146.82	26 01 15.4 113.7	5	18 48 04.25 149.86	24 31 45.8 350.5
6	16 50 55.08 147.03	26 03 09.1 104.4	6	18 50 34.11 149.77	24 25 55.3 360.0
7	16 53 22.11 147.23	26 04 53.5 95.3	7	18 53 03.88 149.68	24 19 55.3 369.5
8	16 55 49.34 147.42	26 06 28.8 86.0	8	18 55 33.56 149.58	24 13 45.8 379.1
9	16 58 16.76 147.61	26 07 54.8 76.6	9	18 58 03.14 149.49	24 07 26.7 388.6
10	17 00 44.37 147.80	26 09 11.4 67.3	10	19 00 32.63 149.38	24 00 58.1 398.0
11	17 03 12.17 147.98	26 10 18.7 57.9	11	19 03 02.01 149.27	23 54 20.1 407.4
12	17 05 40.15 148.15	26 11 16.6 48.5	12	19 05 31.28 149.16	23 47 32.7 416.8
13	17 08 08.30 148.32	26 12 05.1 38.9	13	19 08 00.44 149.04	23 40 35.9 426.1
14	17 10 36.62 148.48	26 12 44.0 29.5	14	19 10 29.48 148.92	23 33 29.8 435.4
15	17 13 05.10 148.64	26 13 13.5 20.0	15	19 12 58.40 148.79	23 26 14.4 444.7
16	17 15 33.74 148.78	26 13 33.5 10.4	16	19 15 27.19 148.66	23 18 49.7 453.9
17	17 18 02.52 148.92	26 13 43.9 - 0.8	17	19 17 55.85 148.53	23 11 15.8 463.1
18	17 20 31.44 149.06	26 13 44.7 + 8.8	18	19 20 24.38 148.39	23 03 32.7 472.2
19	17 23 00.50 149.19	26 13 35.9 18.4	19	19 22 52.77 148.24	22 55 40.5 481.2
20	17 25 29.69 149.32	26 13 17.5 28.0	20	19 25 21.01 148.10	22 47 39.3 490.3
21	17 27 59.01 149.43	26 12 49.5 37.8	21	19 27 49.11 147.95	22 39 29.0 499.2
22	17 30 28.44 149.54	26 12 11.7 47.4	22	19 30 17.06 147.79	22 31 09.8 508.2
23	17 32 57.98 149.65	-26 11 24.3 + 57.2	23	19 32 44.85 147.64	-22 22 41.6 +517.1
Wednesday, March 27			Friday, March 29		
0	17 35 27.63 149.75	-26 10 27.1 + 66.9	0	19 35 12.49 147.48	-22 14 04.5 +525.9
1	17 37 57.38 149.84	26 09 20.2 76.7	1	19 37 39.97 147.31	22 05 18.6 534.7
2	17 40 27.22 149.92	26 08 03.5 86.5	2	19 40 07.28 147.15	21 56 23.9 543.4
3	17 42 57.14 150.00	26 06 37.0 96.2	3	19 42 34.43 146.98	21 47 20.5 552.0
4	17 45 27.14 150.07	26 05 00.8 106.0	4	19 45 01.41 146.81	21 38 08.5 560.7
5	17 47 57.21 150.15	26 03 14.8 115.9	5	19 47 28.22 146.63	21 28 47.8 569.2
6	17 50 27.36 150.20	26 01 18.9 125.6	6	19 49 54.85 146.46	21 19 18.6 577.7
7	17 52 57.56 150.25	25 59 13.3 135.5	7	19 52 21.31 146.27	21 09 40.9 586.0
8	17 55 27.81 150.30	25 56 57.8 145.3	8	19 54 47.58 146.10	20 59 54.9 594.5
9	17 57 58.11 150.34	25 54 32.5 155.2	9	19 57 13.68 145.92	20 50 00.4 602.7
10	18 00 28.45 150.38	25 51 57.3 165.0	10	19 59 39.60 145.73	20 39 57.7 611.0
11	18 02 58.83 150.40	25 49 12.3 174.8	11	20 02 05.33 145.54	20 29 46.7 619.1
12	18 05 29.23 150.42	25 46 17.5 184.7	12	20 04 30.87 145.36	20 19 27.6 627.2
13	18 07 59.65 150.44	25 43 12.8 194.5	13	20 06 56.23 145.16	20 09 00.4 635.3
14	18 10 30.09 150.44	25 39 58.3 204.3	14	20 09 21.39 144.97	19 58 25.1 643.2
15	18 13 00.53 150.45	25 36 34.0 214.2	15	20 11 46.36 144.78	19 47 41.9 651.1
16	18 15 30.98 150.44	25 32 59.8 224.0	16	20 14 11.14 144.59	19 36 50.8 658.9
17	18 18 01.42 150.44	25 29 15.8 233.9	17	20 16 35.73 144.40	19 25 51.9 666.7
18	18 20 31.86 150.42	25 25 21.9 243.6	18	20 19 00.13 144.20	19 14 45.2 674.3
19	18 23 02.28 150.39	25 21 18.3 253.4	19	20 21 24.33 144.00	19 03 30.9 681.9
20	18 25 32.67 150.37	25 17 04.9 263.2	20	20 23 48.33 143.81	18 52 09.0 689.4
21	18 28 03.04 150.33	25 12 41.7 273.0	21	20 26 12.14 143.61	18 40 39.6 696.9
22	18 30 33.37 150.29	25 08 08.7 282.7	22	20 28 35.75 143.41	18 29 02.7 704.2
23	18 33 03.66 150.25	25 03 26.0 +292.5	23	20 30 59.16 143.21	18 17 18.5 +711.6
24	18 35 33.91	-24 58 33.5	24	20 33 22.37	-18 05 26.9

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Saturday, March 30							Monday, April 1						
0	20	33	22.37	143.02	-18	05 26.9	0	22	24	24.57	135.27	-6	41 55.9
1	20	35	45.39	142.81	17	53 28.1	1	22	26	39.84	135.17	6	25 57.7
2	20	38	08.20	142.62	17	41 22.2	2	22	28	55.01	135.08	6	09 56.9
3	20	40	30.82	142.42	17	29 09.3	3	22	31	10.09	134.99	5	53 53.7
4	20	42	53.24	142.23	17	16 49.4	4	22	33	25.08	134.91	5	37 48.2
5	20	45	15.47	142.02	17	04 22.6	5	22	35	39.99	134.84	5	21 40.4
6	20	47	37.49	141.83	16	51 49.0	6	22	37	54.83	134.75	5	05 30.6
7	20	49	59.32	141.64	16	39 08.7	7	22	40	09.58	134.69	4	49 18.8
8	20	52	20.96	141.44	16	26 21.7	8	22	42	24.27	134.62	4	33 05.0
9	20	54	42.40	141.24	16	13 28.2	9	22	44	38.89	134.56	4	16 49.5
10	20	57	03.64	141.05	16	00 28.2	10	22	46	53.45	134.49	4	00 32.3
11	20	59	24.69	140.86	15	47 21.9	11	22	49	07.94	134.44	3	44 13.5
12	21	01	45.55	140.67	15	34 09.2	12	22	51	22.38	134.39	3	27 53.3
13	21	04	06.22	140.48	15	20 50.4	13	22	53	36.77	134.34	3	11 31.7
14	21	06	26.70	140.28	15	07 25.4	14	22	55	51.11	134.30	2	55 08.9
15	21	08	46.98	140.10	14	53 54.4	15	22	58	05.41	134.25	2	38 44.9
16	21	11	07.08	139.92	14	40 17.5	16	23	00	19.66	134.22	2	22 19.9
17	21	13	27.00	139.73	14	26 34.8	17	23	02	33.88	134.19	2	05 54.1
18	21	15	46.73	139.55	14	12 46.3	18	23	04	48.07	134.16	1	49 27.4
19	21	18	06.28	139.37	13	58 52.1	19	23	07	02.23	134.14	1	33 00.0
20	21	20	25.65	139.19	13	44 52.4	20	23	09	16.37	134.12	1	16 32.1
21	21	22	44.84	139.02	13	30 47.2	21	23	11	30.49	134.09	1	00 03.6
22	21	25	03.86	138.83	13	16 36.6	22	23	13	44.58	134.09	0	43 34.9
23	21	27	22.69	138.67	-13	02 20.7	23	23	15	58.67	134.07	-0	27 05.9
						+861.0							+989.2
Sunday, March 31							Tuesday, April 2						
0	21	29	41.36	138.50	-12	47 59.7	0	23	18	12.74	134.07	-0	10 36.7
1	21	31	59.86	138.33	12	33 33.6	1	23	20	26.81	134.07	+	0 05 52.5
2	21	34	18.19	138.16	12	19 02.4	2	23	22	40.88	134.07	0	22 21.6
3	21	36	36.35	138.00	12	04 26.4	3	23	24	54.95	134.08	0	38 50.5
4	21	38	54.35	137.84	11	49 45.6	4	23	27	09.03	134.09	0	55 19.1
5	21	41	12.19	137.68	11	35 00.1	5	23	29	23.12	134.10	1	11 47.2
6	21	43	29.87	137.53	11	20 10.0	6	23	31	37.22	134.13	1	28 14.9
7	21	45	47.40	137.38	11	05 15.3	7	23	33	51.35	134.14	1	44 41.9
8	21	48	04.78	137.22	10	50 16.3	8	23	36	05.49	134.17	2	01 08.1
9	21	50	22.00	137.08	10	35 13.0	9	23	38	19.66	134.20	2	17 33.5
10	21	52	39.08	136.94	10	20 05.4	10	23	40	33.86	134.24	2	33 57.9
11	21	54	56.02	136.79	10	04 53.8	11	23	42	48.10	134.27	2	50 21.2
12	21	57	12.81	136.66	9	49 38.1	12	23	45	02.37	134.31	3	06 43.4
13	21	59	29.47	136.52	9	34 18.6	13	23	47	16.68	134.36	3	23 04.3
14	22	01	45.99	136.40	9	18 55.2	14	23	49	31.04	134.41	3	39 23.7
15	22	04	02.39	136.26	9	03 28.2	15	23	51	45.45	134.46	3	55 41.6
16	22	06	18.65	136.14	8	47 57.6	16	23	53	59.91	134.52	4	11 57.9
17	22	08	34.79	136.02	8	32 23.5	17	23	56	14.43	134.57	4	28 12.4
18	22	10	50.81	135.91	8	16 46.0	18	23	58	29.00	134.64	4	44 25.1
19	22	13	06.72	135.78	8	01 05.2	19	00	00	43.64	134.71	5	00 35.8
20	22	15	22.50	135.68	7	45 21.3	20	00	02	58.35	134.77	5	16 44.5
21	22	17	38.18	135.57	7	29 34.3	21	00	05	13.12	134.85	5	32 51.0
22	22	19	53.75	135.46	7	13 44.3	22	00	07	27.97	134.93	5	48 55.2
23	22	22	09.21	135.36	6	57 51.5	23	00	09	42.90	135.00	6	04 56.9
24	22	24	24.57		-6	41 55.9	24	00	11	57.90		+	6 20 56.2
						+955.6							+959.3

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Wednesday, April 3					Friday, April 5				
0	h m s	° ' "	+ 0 20 56.2	+956.7	0	h m s	° ' "	+17 45 34.1	+713.2
1	0 11 57.90	135.09	6 36 52.9	953.9	1	2 02 23.14	141.71	17 57 27.3	706.0
2	0 14 12.99	135.17	6 52 46.8	951.1	2	2 04 44.85	141.86	18 09 13.3	698.7
3	0 16 28.16	135.27	7 08 37.9	948.2	3	2 07 06.71	142.02	18 20 52.0	691.2
4	0 18 43.43	135.36	7 24 26.1	945.1	4	2 09 28.73	142.18	18 32 23.2	683.8
5	0 20 58.79	135.45	7 40 11.2	942.0	5	2 11 50.91	142.33	18 43 47.0	676.2
6	0 23 14.24	135.55	7 55 53.2	938.7	6	2 14 13.24	142.49	18 55 03.2	668.7
7	0 25 29.79	135.66	8 11 31.9	935.4	7	2 16 35.73	142.63	19 06 11.9	660.9
8	0 27 45.45	135.76	8 27 07.3	931.9	8	2 18 58.36	142.79	19 17 12.8	653.2
9	0 30 01.21	135.87	8 42 39.2	928.3	9	2 21 21.15	142.93	19 28 06.0	645.4
10	0 32 17.08	135.98	8 58 07.5	924.7	10	2 23 44.08	143.08	19 38 51.4	637.5
11	0 34 33.06	136.09	9 13 32.2	920.9	11	2 26 07.16	143.23	19 49 28.9	629.6
12	0 36 49.15	136.21	9 28 53.1	917.0	12	2 28 30.39	143.37	19 59 58.5	621.6
13	0 39 05.36	136.33	9 44 10.1	913.0	13	2 30 53.76	143.51	20 10 20.1	613.5
14	0 41 21.69	136.45	9 59 23.1	908.9	14	2 33 17.27	143.65	20 20 33.6	605.3
15	0 43 38.14	136.57	10 14 32.0	904.7	15	2 35 40.92	143.79	20 30 38.9	597.2
16	0 45 54.71	136.71	10 29 36.7	900.5	16	2 38 04.71	143.92	20 40 36.1	589.0
17	0 48 11.42	136.83	10 44 37.2	896.0	17	2 40 28.63	144.06	20 50 25.1	580.7
18	0 50 28.25	136.96	10 59 33.2	891.5	18	2 42 52.69	144.19	21 00 05.8	572.3
19	0 52 45.21	137.09	11 14 24.7	887.0	19	2 45 16.88	144.31	21 09 38.1	564.0
20	0 55 02.30	137.23	11 29 11.7	882.2	20	2 47 41.19	144.43	21 19 02.1	555.4
21	0 57 19.53	137.37	11 43 53.9	877.4	21	2 50 05.62	144.56	21 28 17.5	547.0
22	0 59 36.90	137.50	11 58 31.3	872.6	22	2 52 30.18	144.67	21 37 24.5	538.4
23	1 01 54.40	137.65	+12 13 03.9	+867.5	23	2 54 54.85	144.79	+21 46 22.9	+529.8
24	1 04 12.05	137.80				2 57 19.64	144.90		
Thursday, April 4					Saturday, April 6				
0	h m s	° ' "	+12 27 31.4	+862.5	0	h m s	° ' "	+21 55 12.7	+521.2
1	1 06 29.85	137.94	12 41 53.9	857.2	1	2 59 44.54	145.01	22 03 53.9	512.4
2	1 08 47.79	138.08	12 56 11.1	852.0	2	3 02 09.55	145.11	22 12 26.3	503.7
3	1 11 05.87	138.24	13 10 23.1	846.6	3	3 04 34.66	145.21	22 20 50.0	495.0
4	1 13 24.11	138.38	13 24 29.7	841.2	4	3 06 59.87	145.31	22 29 05.0	486.1
5	1 15 42.49	138.54	13 38 30.9	835.6	5	3 09 25.18	145.41	22 37 11.1	477.2
6	1 18 01.03	138.69	13 52 26.5	829.9	6	3 11 50.59	145.49	22 45 08.3	468.4
7	1 20 19.72	138.84	14 06 16.4	824.2	7	3 14 16.08	145.58	22 52 56.7	459.5
8	1 22 38.56	139.00	14 20 00.6	818.3	8	3 16 41.66	145.65	23 00 36.2	450.5
9	1 24 57.56	139.15	14 33 38.9	812.4	9	3 19 07.31	145.74	23 08 06.7	441.5
10	1 27 16.71	139.31	14 47 11.3	806.4	10	3 21 33.05	145.81	23 15 28.2	432.4
11	1 29 36.02	139.47	15 00 37.7	800.3	11	3 23 58.86	145.88	23 22 40.6	423.4
12	1 31 55.49	139.63	15 13 58.0	794.1	12	3 26 24.74	145.94	23 29 44.0	414.3
13	1 34 15.12	139.79	15 27 12.1	787.9	13	3 28 50.68	146.00	23 36 38.3	405.2
14	1 36 34.91	139.94	15 40 20.0	781.4	14	3 31 16.68	146.06	23 43 23.5	396.0
15	1 38 54.85	140.11	15 53 21.4	775.0	15	3 33 42.74	146.10	23 49 59.5	386.9
16	1 41 14.96	140.27	16 06 16.4	768.4	16	3 36 08.84	146.15	23 56 26.4	377.7
17	1 43 35.23	140.43	16 19 04.8	761.9	17	3 38 34.99	146.20	24 02 44.1	368.5
18	1 45 55.66	140.58	16 31 46.7	755.1	18	3 41 01.19	146.22	24 08 52.6	359.3
19	1 48 16.24	140.75	16 44 21.8	748.4	19	3 43 27.41	146.26	24 14 51.9	350.0
20	1 50 36.99	140.91	16 56 50.2	741.4	20	3 45 53.67	146.28	24 20 41.9	340.8
21	1 52 57.90	141.07	17 09 11.6	734.6	21	3 48 19.95	146.30	24 26 22.7	331.5
22	1 55 18.97	141.23	17 21 26.2	727.5	22	3 50 46.25	146.32	24 31 54.2	322.1
23	1 57 40.20	141.39	17 33 33.7	720.4	23	3 53 12.57	146.33	24 37 16.3	312.9
24	2 00 01.59	141.55	+17 45 34.1		24	3 55 38.90	146.33	+24 42 29.2	
	2 02 23.14					3 58 05.23			

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Sunday, April 7							Tuesday, April 9						
0	^h 3 58	^m 05.23	^s	+24 42 29.2			0	^h 5 53	^m 27.09	^s	+25 52 27.2		
1	4 00	31.56	146.33	24 47 32.8	+303.6		1	5 55	47.02	139.93	25 50 18.4	-128.8	
2	4 02	57.89	146.33	24 52 27.0	294.2		2	5 58	06.69	139.67	25 48 01.5	136.9	
3	4 05	24.21	146.32	24 57 11.9	284.9		3	6 00	26.11	139.42	25 45 36.3	145.2	
4	4 07	50.51	146.30	25 01 47.5	275.6		4	6 02	45.27	139.16	25 43 03.1	153.2	
5	4 10	16.79	146.28	25 06 13.7	266.2		5	6 05	04.17	138.90	25 40 21.7	161.4	
6	4 12	43.04	146.25	25 10 30.6	256.9		6	6 07	22.80	138.63	25 37 32.4	169.3	
7	4 15	09.25	146.21	25 14 38.1	247.5		7	6 09	41.17	138.37	25 34 35.1	177.3	
8	4 17	35.43	146.18	25 18 36.3	238.2		8	6 11	59.26	138.09	25 31 29.8	185.3	
9	4 20	01.56	146.13	25 22 25.2	228.9		9	6 14	17.08	137.82	25 28 16.7	193.1	
10	4 22	27.65	146.09	25 26 04.7	219.5		10	6 16	34.62	137.54	25 24 55.8	200.9	
11	4 24	53.67	146.02	25 29 34.9	210.2		11	6 18	51.88	137.26	25 21 27.1	208.7	
12	4 27	19.64	145.97	25 32 55.7	200.8		12	6 21	08.85	136.97	25 17 50.7	216.4	
13	4 29	45.54	145.82	25 36 07.2	191.5		13	6 23	25.54	136.69	25 14 06.6	224.1	
14	4 32	11.36	145.75	25 39 09.4	182.2		14	6 25	41.94	136.40	25 10 15.0	231.6	
15	4 34	37.11	145.66	25 42 02.3	172.9		15	6 27	58.05	136.11	25 06 15.8	239.2	
16	4 37	02.77	145.57	25 44 45.9	163.6		16	6 30	13.87	135.82	25 02 09.1	246.7	
17	4 39	28.34	145.48	25 47 20.3	154.4		17	6 32	29.39	135.52	24 57 54.9	254.2	
18	4 41	53.82	145.38	25 49 45.3	145.0		18	6 34	44.61	135.22	24 53 33.4	261.5	
19	4 44	19.20	145.26	25 52 01.1	135.8		19	6 36	59.54	134.93	24 49 04.5	268.9	
20	4 46	44.46	145.16	25 54 07.7	126.6		20	6 39	14.17	134.63	24 44 28.3	276.2	
21	4 49	09.62	145.04	25 56 05.0	117.3		21	6 41	28.49	134.32	24 39 44.9	283.4	
22	4 51	34.66	144.91	25 57 53.2	108.2		22	6 43	42.51	134.02	24 34 54.4	290.5	
23	4 53	59.57	144.79	+25 59 32.1	98.9		23	6 45	56.22	133.71	+24 29 56.7	297.7	
					+89.8					133.40		-304.7	
Monday, April 8							Wednesday, April 10						
0	4 56	24.36	144.65	+26 01 01.9			0	6 48	09.62		+24 24 52.0		
1	4 58	49.01	144.51	26 02 22.6	+80.7		1	6 50	22.72	133.10	24 19 40.3	-311.7	
2	5 01	13.52	144.37	26 03 34.1	71.5		2	6 52	35.50	132.78	24 14 21.7	318.6	
3	5 03	37.89	144.22	26 04 36.6	62.5		3	6 54	47.97	132.47	24 08 56.1	325.6	
4	5 06	02.11	144.06	26 05 30.0	53.4		4	6 57	00.13	132.16	24 03 23.8	332.3	
5	5 08	26.17	143.90	26 06 14.4	44.4		5	6 59	11.98	131.85	23 57 44.6	339.2	
6	5 10	50.07	143.73	26 06 49.8	35.4		6	7 01	23.51	131.53	23 51 58.8	345.8	
7	5 13	13.80	143.57	26 07 16.2	26.4		7	7 03	34.73	131.22	23 46 06.3	352.5	
8	5 15	37.37	143.38	26 07 33.7	17.5		8	7 05	45.63	130.90	23 40 07.2	359.1	
9	5 18	00.75	143.21	26 07 42.3	+8.6		9	7 07	56.22	130.59	23 34 01.5	365.7	
10	5 20	23.96	143.01	26 07 42.0	-0.3		10	7 10	06.50	130.28	23 27 49.4	372.1	
11	5 22	46.97	142.83	26 07 32.8	9.2		11	7 12	16.45	129.95	23 21 30.8	378.6	
12	5 25	09.80	142.63	26 07 14.9	17.9		12	7 14	26.09	129.64	23 15 05.9	384.9	
13	5 27	32.43	142.43	26 06 48.2	26.7		13	7 16	35.41	129.32	23 08 34.7	391.2	
14	5 29	54.86	142.22	26 06 12.8	35.4		14	7 18	44.42	129.01	23 01 57.2	397.5	
15	5 32	17.08	142.01	26 05 28.7	44.1		15	7 20	53.10	128.68	22 55 13.5	403.7	
16	5 34	39.09	141.80	26 04 35.9	52.8		16	7 23	01.47	128.37	22 48 23.7	409.8	
17	5 37	00.89	141.57	26 03 34.5	61.4		17	7 25	09.53	128.06	22 41 27.8	415.9	
18	5 39	22.46	141.36	26 02 24.6	69.9		18	7 27	17.27	127.74	22 34 25.9	421.9	
19	5 41	43.82	141.13	26 01 06.1	78.5		19	7 29	24.69	127.42	22 27 18.0	427.9	
20	5 44	04.95	140.89	25 59 39.1	87.0		20	7 31	31.80	127.11	22 20 04.2	433.8	
21	5 46	25.84	140.66	25 58 03.7	95.4		21	7 33	38.59	126.79	22 12 44.5	439.7	
22	5 48	46.50	140.42	25 56 19.9	103.8		22	7 35	45.07	126.48	22 05 19.1	445.4	
23	5 51	06.92	140.17	25 54 27.7	112.2		23	7 37	51.23	126.16	21 57 47.9	451.2	
24	5 53	27.09		+25 52 27.2	-120.5		24	7 39	57.08	125.85	+21 50 11.0	-456.9	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Thursday, April 11					Saturday, April 13				
0	h m s	° ' "	h m s	° ' "	0	h m s	° ' "	h m s	° ' "
0	7 39 57.08	125.54	+21 50 11.0	-462.5	0	9 15 03.52	112.89	+14 10 42.5	-671.2
1	7 42 02.62	125.23	21 42 28.5	468.1	1	9 16 56.41	112.69	13 59 31.3	674.4
2	7 44 07.85	124.92	21 34 40.4	473.7	2	9 18 49.10	112.50	13 48 16.9	677.4
3	7 46 12.77	124.61	21 26 46.7	479.0	3	9 20 41.60	112.30	13 36 59.5	680.6
4	7 48 17.38	124.30	21 18 47.7	484.5	4	9 22 33.90	112.12	13 25 38.9	683.6
5	7 50 21.68	124.00	21 10 43.2	489.9	5	9 24 26.02	111.94	13 14 15.3	686.6
6	7 52 25.68	123.69	21 02 33.3	495.1	6	9 26 17.96	111.76	13 02 48.7	689.5
7	7 54 29.37	123.40	20 54 18.2	500.4	7	9 28 09.72	111.58	12 51 19.2	692.5
8	7 56 32.77	123.09	20 45 57.8	505.6	8	9 30 01.30	111.41	12 39 46.7	695.3
9	7 58 35.86	122.78	20 37 32.2	510.7	9	9 31 52.71	111.24	12 28 11.4	698.1
10	8 00 38.64	122.49	20 29 01.5	515.8	10	9 33 43.95	111.08	12 16 33.3	700.9
11	8 02 41.13	122.20	20 20 25.7	520.8	11	9 35 35.03	110.91	12 04 52.4	703.6
12	8 04 43.33	121.90	20 11 44.9	525.8	12	9 37 25.94	110.75	11 53 08.8	706.3
13	8 06 45.23	121.61	20 02 59.1	530.7	13	9 39 16.69	110.60	11 41 22.5	709.0
14	8 08 46.84	121.31	19 54 08.4	535.5	14	9 41 07.29	110.45	11 29 33.5	711.5
15	8 10 48.15	121.03	19 45 12.9	540.4	15	9 42 57.74	110.29	11 17 42.0	714.1
16	8 12 49.18	120.73	19 36 12.5	545.1	16	9 44 48.03	110.16	11 05 47.9	716.7
17	8 14 49.91	120.46	19 27 07.4	549.9	17	9 46 38.19	110.01	10 53 51.2	719.1
18	8 16 50.37	120.17	19 17 57.5	554.5	18	9 48 28.20	109.88	10 41 52.1	721.5
19	8 18 50.54	119.89	19 08 43.0	559.1	19	9 50 18.08	109.74	10 29 50.6	724.0
20	8 20 50.43	119.61	18 59 23.9	563.6	20	9 52 07.82	109.61	10 17 46.6	726.3
21	8 22 50.04	119.33	18 50 00.3	568.2	21	9 53 57.43	109.48	10 05 40.3	728.6
22	8 24 49.37	119.06	18 40 32.1	572.6	22	9 55 46.91	109.36	9 53 31.7	730.9
23	8 26 48.43	118.79	+18 30 59.5	-577.0	23	9 57 36.27	109.24	+9 41 20.8	-733.1
Friday, April 12					Sunday, April 14				
0	8 28 47.22	118.52	+18 21 22.5	-581.3	0	9 59 25.51	109.13	+9 29 07.7	-735.3
1	8 30 45.74	118.25	18 11 41.2	585.7	1	10 01 14.64	109.01	9 16 52.4	737.5
2	8 32 43.99	117.99	18 01 55.5	589.9	2	10 03 03.65	108.90	9 04 34.9	739.6
3	8 34 41.98	117.72	17 52 05.6	594.1	3	10 04 52.55	108.80	8 52 15.3	741.6
4	8 36 39.70	117.47	17 42 11.5	598.2	4	10 06 41.35	108.70	8 39 53.7	743.7
5	8 38 37.17	117.21	17 32 13.3	602.4	5	10 08 30.05	108.60	8 27 30.0	745.6
6	8 40 34.38	116.96	17 22 10.9	606.4	6	10 10 18.65	108.51	8 15 04.4	747.6
7	8 42 31.34	116.70	17 12 04.5	610.4	7	10 12 07.16	108.42	8 02 36.8	749.6
8	8 44 28.04	116.46	17 01 54.1	614.3	8	10 13 55.58	108.33	7 50 07.2	751.3
9	8 46 24.50	116.21	16 51 39.8	618.3	9	10 15 43.91	108.25	7 37 35.9	753.2
10	8 48 20.71	115.96	16 41 21.5	622.1	10	10 17 32.16	108.17	7 25 02.7	755.0
11	8 50 16.67	115.73	16 30 59.4	625.9	11	10 19 20.33	108.09	7 12 27.7	756.7
12	8 52 12.40	115.49	16 20 33.5	629.7	12	10 21 08.42	108.02	6 59 51.0	758.4
13	8 54 07.89	115.26	16 10 03.8	633.4	13	10 22 56.44	107.96	6 47 12.6	760.1
14	8 56 03.15	115.03	15 59 30.4	637.0	14	10 24 44.40	107.89	6 34 32.5	761.7
15	8 57 58.18	114.79	15 48 53.4	640.7	15	10 26 32.29	107.83	6 21 50.8	763.3
16	8 59 52.97	114.58	15 38 12.7	644.2	16	10 28 20.12	107.77	6 09 07.5	764.8
17	9 01 47.55	114.35	15 27 28.5	647.8	17	10 30 07.89	107.72	5 56 22.7	766.3
18	9 03 41.90	114.13	15 16 40.7	651.3	18	10 31 55.61	107.67	5 43 36.4	767.8
19	9 05 36.03	113.92	15 05 49.4	654.7	19	10 33 43.28	107.63	5 30 48.6	769.2
20	9 07 29.95	113.70	14 54 54.7	658.1	20	10 35 30.91	107.58	5 17 59.4	770.6
21	9 09 23.65	113.50	14 43 56.6	661.4	21	10 37 18.49	107.55	5 05 08.8	771.9
22	9 11 17.15	113.28	14 32 55.2	664.7	22	10 39 06.04	107.52	4 52 16.9	773.2
23	9 13 10.43	113.09	14 21 50.5	-668.0	23	10 40 53.56	107.48	4 39 23.7	-774.5
24	9 15 03.52		+14 10 42.5		24	10 42 41.04		+4 26 29.2	

(330/3544)

(NAUTICAL ALMANAC, 1935)

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THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Monday, April 15							Wednesday, April 17						
0	10 ^h 42 ^m 41 ^s .04	107.46	+ 4 26 29.2	-775.7	0	12 ^h 09 ^m 20 ^s .46	110.73	- 6 03 52.5	-783.1				
1	10 44 28.50	107.44	4 13 33.5	776.9	1	12 11 11.19	110.88	6 16 55.6	782.1				
2	10 46 15.94	107.42	4 00 36.6	778.0	2	12 13 02.07	111.05	6 29 57.7	781.1				
3	10 48 03.36	107.40	3 47 38.6	779.1	3	12 14 53.12	111.22	6 42 58.8	780.0				
4	10 49 50.76	107.39	3 34 39.5	780.1	4	12 16 44.34	111.39	6 55 58.8	778.8				
5	10 51 38.15	107.39	3 21 39.4	781.2	5	12 18 35.73	111.57	7 08 57.6	777.6				
6	10 53 25.54	107.39	3 08 38.2	782.1	6	12 20 27.30	111.74	7 21 55.2	776.4				
7	10 55 12.93	107.38	2 55 36.1	783.0	7	12 22 19.04	111.93	7 34 51.6	775.0				
8	10 57 00.31	107.39	2 42 33.1	784.0	8	12 24 10.97	112.12	7 47 46.6	773.7				
9	10 58 47.70	107.40	2 29 29.1	784.7	9	12 26 03.09	112.31	8 00 40.3	772.2				
10	11 00 35.10	107.41	2 16 24.4	785.6	10	12 27 55.40	112.51	8 13 32.5	770.8				
11	11 02 22.51	107.42	2 03 18.8	786.4	11	12 29 47.91	112.70	8 26 23.3	769.2				
12	11 04 09.93	107.45	1 50 12.4	787.1	12	12 31 40.61	112.91	8 39 12.5	767.6				
13	11 05 57.38	107.46	1 37 05.3	787.7	13	12 33 33.52	113.11	8 52 00.1	766.0				
14	11 07 44.84	107.50	1 23 57.6	788.4	14	12 35 26.63	113.32	9 04 46.1	764.3				
15	11 09 32.34	107.53	1 10 49.2	788.9	15	12 37 19.95	113.53	9 17 30.4	762.5				
16	11 11 19.87	107.56	0 57 40.3	789.6	16	12 39 13.48	113.75	9 30 12.9	760.7				
17	11 13 07.43	107.61	0 44 30.7	790.0	17	12 41 07.23	113.97	9 42 53.6	758.9				
18	11 14 55.04	107.65	0 31 20.7	790.5	18	12 43 01.20	114.19	9 55 32.5	756.9				
19	11 16 42.69	107.69	0 18 10.2	790.9	19	12 44 55.39	114.42	10 08 09.4	754.9				
20	11 18 30.38	107.75	+ 0 04 59.3	791.2	20	12 46 49.81	114.64	10 20 44.3	752.8				
21	11 20 18.13	107.79	- 0 08 11.9	791.7	21	12 48 44.45	114.88	10 33 17.1	750.8				
22	11 22 05.92	107.86	0 21 23.6	791.9	22	12 50 39.33	115.12	10 45 47.9	748.5				
23	11 23 53.78	107.92	- 0 34 35.5	-792.1	23	12 52 34.45	115.36	-10 58 16.4	-746.4				
Tuesday, April 16							Thursday, April 18						
0	11 25 41.70	107.99	- 0 47 47.6	-792.3	0	12 54 29.81	115.60	-11 10 42.8	-744.1				
1	11 27 29.69	108.05	1 00 59.9	792.5	1	12 56 25.41	115.85	11 23 06.9	741.7				
2	11 29 17.74	108.13	1 14 12.4	792.6	2	12 58 21.26	116.10	11 35 28.6	739.3				
3	11 31 05.87	108.21	1 27 25.0	792.6	3	13 00 17.36	116.35	11 47 47.9	736.8				
4	11 32 54.08	108.29	1 40 37.6	792.7	4	13 02 13.71	116.61	12 00 04.7	734.4				
5	11 34 42.37	108.37	1 53 50.3	792.7	5	13 04 10.32	116.87	12 12 19.1	731.7				
6	11 36 30.74	108.47	2 07 03.0	792.5	6	13 06 07.19	117.13	12 24 30.8	729.0				
7	11 38 19.21	108.56	2 20 15.5	792.5	7	13 08 04.32	117.40	12 36 39.8	726.4				
8	11 40 07.77	108.65	2 33 28.0	792.3	8	13 10 01.72	117.66	12 48 46.2	723.5				
9	11 41 56.42	108.75	2 46 40.3	792.1	9	13 11 59.38	117.94	13 00 49.7	720.7				
10	11 43 45.17	108.86	2 59 52.4	791.8	10	13 13 57.32	118.22	13 12 50.4	717.8				
11	11 45 34.03	108.97	3 13 04.2	791.5	11	13 15 55.54	118.49	13 24 48.2	714.8				
12	11 47 23.00	109.08	3 26 15.7	791.2	12	13 17 54.03	118.77	13 36 43.0	711.8				
13	11 49 12.08	109.20	3 39 26.9	790.7	13	13 19 52.80	119.06	13 48 34.8	708.6				
14	11 51 01.28	109.31	3 52 37.6	790.4	14	13 21 51.86	119.34	14 00 23.4	705.5				
15	11 52 50.59	109.44	4 05 48.0	789.8	15	13 23 51.20	119.64	14 12 08.9	702.2				
16	11 54 40.03	109.57	4 18 57.8	789.2	16	13 25 50.84	119.93	14 23 51.1	699.0				
17	11 56 29.60	109.70	4 32 07.0	788.7	17	13 27 50.77	120.22	14 35 30.1	695.5				
18	11 58 19.30	109.83	4 45 15.7	788.0	18	13 29 50.99	120.52	14 47 05.6	692.1				
19	12 00 09.13	109.97	4 58 23.7	787.4	19	13 31 51.51	120.83	14 58 37.7	688.6				
20	12 01 59.10	110.12	5 11 31.1	786.6	20	13 33 52.34	121.12	15 10 06.3	685.0				
21	12 03 49.22	110.26	5 24 37.7	785.8	21	13 35 53.46	121.43	15 21 31.3	681.4				
22	12 05 39.48	110.41	5 37 43.5	784.9	22	13 37 54.89	121.74	15 32 52.7	677.6				
23	12 07 29.89	110.57	5 50 48.4	-784.1	23	13 39 56.63	122.05	15 44 10.3	-673.9				
24	12 09 20.46		- 6 03 52.5		24	13 41 58.68		-15 55 24.2					

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Friday, April 19					Sunday, April 21				
0	13 ^h 41 ^m 58.68 ^s	122.36	-15° 55' 24.2"	-670.0	0	15 ^h 26 ^m 11.59 ^s	138.62	-23° 16' 44.6"	-399.5
1	13 44 01.04	122.68	16 06 34.2	666.1	1	15 28 30.21	138.94	23 23 24.1	392.2
2	13 46 03.72	123.00	16 17 40.3	662.1	2	15 30 49.15	139.27	23 29 56.3	384.6
3	13 48 06.72	123.32	16 28 42.4	658.1	3	15 33 08.42	139.59	23 36 20.9	377.1
4	13 50 10.04	123.64	16 39 40.5	653.9	4	15 35 28.01	139.90	23 42 38.0	369.5
5	13 52 13.68	123.96	16 50 34.4	649.7	5	15 37 47.91	140.21	23 48 47.5	361.7
6	13 54 17.64	124.29	17 01 24.1	645.4	6	15 40 08.12	140.52	23 54 49.2	354.1
7	13 56 21.93	124.61	17 12 09.5	641.0	7	15 42 28.64	140.83	24 00 43.3	346.2
8	13 58 26.54	124.95	17 22 50.5	636.7	8	15 44 49.47	141.14	24 06 29.5	338.4
9	14 00 31.49	125.27	17 33 27.2	632.1	9	15 47 10.61	141.43	24 12 07.9	330.3
10	14 02 36.76	125.61	17 43 59.3	627.6	10	15 49 32.04	141.73	24 17 38.2	322.4
11	14 04 42.37	125.95	17 54 26.9	622.9	11	15 51 53.77	142.02	24 23 00.6	314.3
12	14 06 48.32	126.28	18 04 49.8	618.2	12	15 54 15.79	142.31	24 28 14.9	306.2
13	14 08 54.60	126.62	18 15 08.0	613.5	13	15 56 38.10	142.60	24 33 21.1	298.0
14	14 11 01.22	126.96	18 25 21.5	608.6	14	15 59 00.70	142.87	24 38 19.1	289.8
15	14 13 08.18	127.30	18 35 30.1	603.6	15	16 01 23.57	143.16	24 43 08.9	281.4
16	14 15 15.48	127.64	18 45 33.7	598.7	16	16 03 46.73	143.43	24 47 50.3	273.1
17	14 17 23.12	127.98	18 55 32.4	593.6	17	16 06 10.16	143.69	24 52 23.4	264.6
18	14 19 31.10	128.33	19 05 26.0	588.4	18	16 08 33.85	143.96	24 56 48.0	256.1
19	14 21 39.43	128.67	19 15 14.4	583.1	19	16 10 57.81	144.21	25 01 04.1	247.7
20	14 23 48.10	129.02	19 24 57.5	577.9	20	16 13 22.02	144.47	25 05 11.8	239.0
21	14 25 57.12	129.36	19 34 35.4	572.6	21	16 15 46.49	144.72	25 09 10.8	230.4
22	14 28 06.48	129.71	19 44 08.0	567.0	22	16 18 11.21	144.96	25 13 01.2	221.7
23	14 30 16.19	130.06	-19 53 35.0	-561.6	23	16 20 36.17	145.20	-25 16 42.9	-212.9
Saturday, April 20					Monday, April 22				
0	14 32 26.25	130.41	-20 02 56.6	-555.9	0	16 23 01.37	145.43	-25 20 15.8	-204.2
1	14 34 36.66	130.75	20 12 12.5	550.3	1	16 25 26.80	145.67	25 23 40.0	195.3
2	14 36 47.41	131.11	20 21 22.8	544.6	2	16 27 52.47	145.88	25 26 55.3	186.4
3	14 38 58.52	131.45	20 30 27.4	538.7	3	16 30 18.35	146.10	25 30 01.7	177.5
4	14 41 09.97	131.81	20 39 26.1	532.8	4	16 32 44.45	146.32	25 32 59.2	168.5
5	14 43 21.78	132.15	20 48 18.9	526.8	5	16 35 10.77	146.52	25 35 47.7	159.4
6	14 45 33.93	132.50	20 57 05.7	520.9	6	16 37 37.29	146.71	25 38 27.1	150.4
7	14 47 46.43	132.85	21 05 46.6	514.7	7	16 40 04.00	146.92	25 40 57.5	141.3
8	14 49 59.28	133.19	21 14 21.3	508.5	8	16 42 30.92	147.10	25 43 18.8	132.2
9	14 52 12.47	133.54	21 22 49.8	502.2	9	16 44 58.02	147.29	25 45 31.0	122.9
10	14 54 26.01	133.89	21 31 12.0	495.9	10	16 47 25.31	147.46	25 47 33.9	113.7
11	14 56 39.90	134.24	21 39 27.9	489.5	11	16 49 52.77	147.63	25 49 27.6	104.5
12	14 58 54.14	134.58	21 47 37.4	483.0	12	16 52 20.40	147.80	25 51 12.1	95.1
13	15 01 08.72	134.93	21 55 40.4	476.4	13	16 54 48.20	147.95	25 52 47.2	85.9
14	15 03 23.65	135.27	22 03 36.8	469.8	14	16 57 16.15	148.10	25 54 13.1	76.4
15	15 05 38.92	135.62	22 11 26.6	463.1	15	16 59 44.25	148.25	25 55 29.5	67.1
16	15 07 54.54	135.96	22 19 09.7	456.4	16	17 02 12.50	148.39	25 56 36.6	57.6
17	15 10 10.50	136.29	22 26 46.1	449.5	17	17 04 40.89	148.52	25 57 34.2	48.3
18	15 12 26.79	136.63	22 34 15.6	442.5	18	17 07 09.41	148.64	25 58 22.5	38.7
19	15 14 43.42	136.97	22 41 38.1	435.6	19	17 09 38.05	148.76	25 59 01.2	29.3
20	15 17 00.39	137.31	22 48 53.7	428.5	20	17 12 06.81	148.87	25 59 30.5	19.7
21	15 19 17.70	137.63	22 56 02.2	421.4	21	17 14 35.68	148.98	25 59 50.2	10.2
22	15 21 35.33	137.97	23 03 03.6	414.1	22	17 17 04.66	149.07	26 00 00.4	- 0.7
23	15 23 53.30	138.29	23 09 57.7	-406.9	23	17 19 33.73	149.17	26 00 01.1	+ 9.0
24	15 26 11.59		-23 16 44.6		24	17 22 02.90		-25 59 52.1	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Tuesday, April 23			Thursday, April 25		
0	^{h m s} 17 22 02.90 ^s	^{° ' "} -25 59 52.1 ^s	0	^{h m s} 19 21 02.07 ^s	^{° ' "} -22 45 39.0 ^s
1	17 24 32.15 ^s	25 59 33.6 ^s + 18.5	1	19 23 28.01 ^s	22 37 51.1 ^s +467.9
2	17 27 01.48 ^s	25 59 05.4 ^s 28.2	2	19 25 53.76 ^s	22 29 54.7 ^s 476.4
3	17 29 30.88 ^s	25 58 27.6 ^s 37.8	3	19 28 19.32 ^s	22 21 49.8 ^s 484.9
4	17 32 00.35 ^s	25 57 40.2 ^s 47.4	4	19 30 44.68 ^s	22 13 36.5 ^s 493.3
5	17 34 29.87 ^s	25 56 43.1 ^s 57.1	5	19 33 09.85 ^s	22 05 14.9 ^s 501.6
6	17 36 59.44 ^s	25 55 36.4 ^s 66.7	6	19 35 34.81 ^s	21 56 44.9 ^s 510.0
7	17 39 29.05 ^s	25 54 20.1 ^s 76.3	7	19 37 59.57 ^s	21 48 06.7 ^s 518.2
8	17 41 58.70 ^s	25 52 54.1 ^s 86.0	8	19 40 24.12 ^s	21 39 20.3 ^s 526.4
9	17 44 28.38 ^s	25 51 18.4 ^s 95.7	9	19 42 48.46 ^s	21 30 25.7 ^s 534.6
10	17 46 58.09 ^s	25 49 33.0 ^s 105.4	10	19 45 12.60 ^s	21 21 23.1 ^s 542.6
11	17 49 27.81 ^s	25 47 38.0 ^s 115.0	11	19 47 36.52 ^s	21 12 12.5 ^s 550.6
12	17 51 57.54 ^s	25 45 33.3 ^s 124.7	12	19 50 00.23 ^s	21 02 53.9 ^s 558.6
13	17 54 27.27 ^s	25 43 18.9 ^s 134.4	13	19 52 23.72 ^s	20 53 27.5 ^s 566.4
14	17 56 57.00 ^s	25 40 54.9 ^s 144.0	14	19 54 46.99 ^s	20 43 53.2 ^s 574.3
15	17 59 26.72 ^s	25 38 21.2 ^s 153.7	15	19 57 10.05 ^s	20 34 11.2 ^s 582.0
16	18 01 56.42 ^s	25 35 37.9 ^s 163.3	16	19 59 32.88 ^s	20 24 21.5 ^s 589.7
17	18 04 26.10 ^s	25 32 44.9 ^s 173.0	17	20 01 55.49 ^s	20 14 24.2 ^s 597.3
18	18 06 55.75 ^s	25 29 42.3 ^s 182.6	18	20 04 17.88 ^s	20 04 19.4 ^s 604.8
19	18 09 25.36 ^s	25 26 30.0 ^s 192.3	19	20 06 40.05 ^s	19 54 07.0 ^s 612.4
20	18 11 54.93 ^s	25 23 08.2 ^s 201.8	20	20 09 01.99 ^s	19 43 47.3 ^s 619.7
21	18 14 24.44 ^s	25 19 36.8 ^s 211.4	21	20 11 23.71 ^s	19 33 20.2 ^s 627.1
22	18 16 53.91 ^s	25 15 55.8 ^s 221.0	22	20 13 45.21 ^s	19 22 45.9 ^s 634.3
23	18 19 23.31 ^s	-25 12 05.2 ^s 230.6	23	20 16 06.48 ^s	19 12 04.4 ^s 641.5
		+240.1			+648.7
Wednesday, April 24			Friday, April 26		
0	18 21 52.64 ^s	-25 08 05.1 ^s	0	20 18 27.52 ^s	-19 01 15.7 ^s
1	18 24 21.90 ^s	25 03 55.5 ^s +249.6	1	20 20 48.33 ^s	18 50 20.0 ^s +655.7
2	18 26 51.08 ^s	24 59 36.4 ^s 259.1	2	20 23 08.93 ^s	18 39 17.3 ^s 662.7
3	18 29 20.17 ^s	24 55 07.8 ^s 268.6	3	20 25 29.30 ^s	18 28 07.7 ^s 669.6
4	18 31 49.17 ^s	24 50 29.8 ^s 278.0	4	20 27 49.44 ^s	18 16 51.2 ^s 676.5
5	18 34 18.08 ^s	24 45 42.3 ^s 287.5	5	20 30 09.35 ^s	18 05 28.0 ^s 683.2
6	18 36 46.88 ^s	24 40 45.5 ^s 296.8	6	20 32 29.04 ^s	17 53 58.1 ^s 689.9
7	18 39 15.58 ^s	24 35 39.3 ^s 306.2	7	20 34 48.51 ^s	17 42 21.6 ^s 696.5
8	18 41 44.16 ^s	24 30 23.8 ^s 315.5	8	20 37 07.76 ^s	17 30 38.6 ^s 703.0
9	18 44 12.62 ^s	24 24 59.1 ^s 324.7	9	20 39 26.78 ^s	17 18 49.1 ^s 709.5
10	18 46 40.96 ^s	24 19 25.0 ^s 334.1	10	20 41 45.58 ^s	17 06 53.3 ^s 715.8
11	18 49 09.18 ^s	24 13 41.8 ^s 343.2	11	20 44 04.16 ^s	16 54 51.1 ^s 722.2
12	18 51 37.25 ^s	24 07 49.3 ^s 352.5	12	20 46 22.52 ^s	16 42 42.7 ^s 728.4
13	18 54 05.19 ^s	24 01 47.7 ^s 361.6	13	20 48 40.66 ^s	16 30 28.2 ^s 734.5
14	18 56 32.98 ^s	23 55 37.0 ^s 370.7	14	20 50 58.59 ^s	16 18 07.6 ^s 740.6
15	18 59 00.62 ^s	23 49 17.3 ^s 379.7	15	20 53 16.30 ^s	16 05 41.0 ^s 746.6
16	19 01 28.11 ^s	23 42 48.5 ^s 388.8	16	20 55 33.79 ^s	15 53 08.5 ^s 752.5
17	19 03 55.45 ^s	23 36 10.7 ^s 397.8	17	20 57 51.08 ^s	15 40 30.2 ^s 758.3
18	19 06 22.62 ^s	23 29 24.0 ^s 406.7	18	21 00 08.15 ^s	15 27 46.1 ^s 764.1
19	19 08 49.63 ^s	23 22 28.4 ^s 415.6	19	21 02 25.01 ^s	15 14 56.4 ^s 769.7
20	19 11 16.47 ^s	23 15 24.0 ^s 424.4	20	21 04 41.67 ^s	15 02 01.1 ^s 775.3
21	19 13 43.14 ^s	23 08 10.9 ^s 433.1	21	21 06 58.13 ^s	14 49 00.3 ^s 780.8
22	19 16 09.63 ^s	23 00 48.9 ^s 442.0	22	21 09 14.38 ^s	14 35 54.0 ^s 786.3
23	19 18 35.94 ^s	22 53 18.3 ^s 450.6	23	21 11 30.43 ^s	14 22 42.4 ^s 791.6
24	19 21 02.07 ^s	-22 45 39.0 ^s +459.3	24	21 13 46.29 ^s	-14 09 25.6 ^s +796.8

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination				
Saturday, April 27							Monday, April 29								
0	h	m	s	°	'	"	0	h	m	s	°	'	"		
0	21	13	46.29	135.66	-14	09 25.6	+802.0	0	22	59	36.33	130.26	-2	16 51.8	+948.4
1	21	16	01.95	135.47	13	56 03.6	807.1	1	23	01	46.59	130.25	2	01 03.4	949.3
2	21	18	17.42	135.28	13	42 36.5	812.1	2	23	03	56.84	130.24	1	45 14.1	950.1
3	21	20	32.70	135.08	13	29 04.4	817.1	3	23	06	07.08	130.23	1	29 24.0	950.7
4	21	22	47.78	134.91	13	15 27.3	821.9	4	23	08	17.31	130.23	0	13 33.3	951.2
5	21	25	02.69	134.72	13	01 45.4	826.6	5	23	10	27.54	130.23	0	57 42.1	951.8
6	21	27	17.41	134.54	12	47 58.8	831.3	6	23	12	37.78	130.24	0	41 50.3	952.1
7	21	29	31.95	134.37	12	34 07.5	835.9	7	23	14	48.02	130.26	0	25 58.2	952.4
8	21	31	46.32	134.19	12	20 11.6	840.4	8	23	16	58.28	130.27	-	0 10 05.8	952.5
9	21	34	00.51	134.02	12	06 11.2	844.8	9	23	19	08.55	130.29	+	0 05 46.7	952.7
10	21	36	14.53	133.86	11	52 06.4	849.2	10	23	21	18.84	130.32	0	21 39.4	952.6
11	21	38	28.39	133.69	11	37 57.2	853.4	11	23	23	29.16	130.35	0	37 32.0	952.5
12	21	40	42.08	133.53	11	23 43.8	857.6	12	23	25	39.51	130.38	0	53 24.5	952.4
13	21	42	55.61	133.37	11	09 26.2	861.6	13	23	27	49.89	130.42	1	09 16.9	952.0
14	21	45	08.98	133.22	10	55 04.6	865.7	14	23	30	00.31	130.46	1	25 08.9	951.7
15	21	47	22.20	133.06	10	40 38.9	869.5	15	23	32	10.77	130.51	1	41 00.6	951.1
16	21	49	35.26	132.92	10	26 09.4	873.4	16	23	34	21.28	130.57	1	56 51.7	950.6
17	21	51	48.18	132.78	10	11 36.0	877.1	17	23	36	31.85	130.61	2	12 42.3	949.9
18	21	54	00.96	132.63	9	56 58.9	880.7	18	23	38	42.46	130.68	2	28 32.2	949.2
19	21	56	13.59	132.50	9	42 18.2	884.2	19	23	40	53.14	130.73	2	44 21.4	948.2
20	21	58	26.09	132.36	9	27 34.0	887.8	20	23	43	03.87	130.81	3	00 09.6	947.3
21	22	00	38.45	132.24	9	12 46.2	891.1	21	23	45	14.68	130.88	3	15 56.9	946.3
22	22	02	50.69	132.11	8	57 55.1	894.5	22	23	47	25.56	130.95	3	31 43.2	945.1
23	22	05	02.80	131.98	-	8 43 00.6	+897.6	23	23	49	36.51	131.03	+	3 47 28.3	+943.8
Sunday, April 28							Tuesday, April 30								
0	22	07	14.78	131.87	-	8 28 03.0	+900.7	0	23	51	47.54	131.11	+	4 03 12.1	+942.5
1	22	09	26.65	131.75	8	13 02.3	903.8	1	23	53	58.65	131.21	4	18 54.6	941.0
2	22	11	38.40	131.64	7	57 58.5	906.7	2	23	56	09.86	131.29	4	34 35.6	939.5
3	22	13	50.04	131.54	7	42 51.8	909.6	3	23	58	21.15	131.39	4	50 15.1	937.8
4	22	16	01.58	131.43	7	27 42.2	912.3	4	0	00	32.54	131.49	5	05 52.9	936.1
5	22	18	13.01	131.34	7	12 29.9	915.0	5	0	02	44.03	131.60	5	21 29.0	934.3
6	22	20	24.35	131.24	6	57 14.9	917.5	6	0	04	55.63	131.70	5	37 03.3	932.3
7	22	22	35.59	131.16	6	41 57.4	920.1	7	0	07	07.33	131.81	5	52 35.6	930.3
8	22	24	46.75	131.07	6	26 37.3	922.4	8	0	09	19.14	131.93	6	08 05.9	928.1
9	22	26	57.82	130.99	6	11 14.9	924.8	9	0	11	31.07	132.05	6	23 34.0	926.0
10	22	29	08.81	130.91	5	55 50.1	927.0	10	0	13	43.12	132.17	6	39 00.0	923.6
11	22	31	19.72	130.83	5	40 23.1	929.1	11	0	15	55.29	132.29	6	54 23.6	921.1
12	22	33	30.55	130.77	5	24 54.0	931.1	12	0	18	07.58	132.42	7	09 44.7	918.7
13	22	35	41.32	130.69	5	09 22.9	933.1	13	0	20	20.00	132.56	7	25 03.4	916.0
14	22	37	52.01	130.64	4	53 49.8	935.0	14	0	22	32.56	132.69	7	40 19.4	913.3
15	22	40	02.65	130.58	4	38 14.8	936.7	15	0	24	45.25	132.84	7	55 32.7	910.5
16	22	42	13.23	130.53	4	22 38.1	938.4	16	0	26	58.09	132.98	8	10 43.2	907.6
17	22	44	23.76	130.47	4	06 59.7	940.0	17	0	29	11.07	133.12	8	25 50.8	904.6
18	22	46	34.23	130.44	3	51 19.7	941.5	18	0	31	24.19	133.27	8	40 55.4	901.5
19	22	48	44.67	130.39	3	35 38.2	942.8	19	0	33	37.46	133.42	8	55 56.9	898.2
20	22	50	55.06	130.36	3	19 55.4	944.2	20	0	35	50.88	133.58	9	10 55.1	895.0
21	22	53	05.42	130.33	3	04 11.2	945.4	21	0	38	04.46	133.74	9	25 50.1	891.6
22	22	55	15.75	130.30	2	48 25.8	946.5	22	0	40	18.20	133.90	9	40 41.7	888.0
23	22	57	26.05	130.28	2	32 39.3	+947.5	23	0	42	32.10	134.07	9	55 29.7	+884.5
24	22	59	36.33		-	2 16 51.8		24	0	44	46.17		+10	10 14.2	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Wednesday, May 1			Friday, May 3		
0	^{h m} 0 44 46.17 ^s 134.23	+10 10 14.2	0	^{h m} 2 35 50.30 ^s 143.80	+20 16 47.7
1	0 47 00.40 134.41	10 24 55.0	1	2 38 14.10 143.99	20 26 43.9
2	0 49 14.81 134.58	10 39 32.0	2	2 40 38.09 144.17	20 36 32.1
3	0 51 29.39 134.75	10 54 05.1	3	2 43 02.26 144.35	20 46 12.3
4	0 53 44.14 134.93	11 08 34.3	4	2 45 26.61 144.53	20 55 44.5
5	0 55 59.07 135.11	11 22 59.3	5	2 47 51.14 144.70	21 05 08.5
6	0 58 14.18 135.30	11 37 20.2	6	2 50 15.84 144.87	21 14 24.4
7	1 00 29.48 135.48	11 51 36.8	7	2 52 40.71 145.04	21 23 32.0
8	1 02 44.96 135.66	12 05 49.1	8	2 55 05.75 145.20	21 32 31.3
9	1 05 00.62 135.86	12 19 56.9	9	2 57 30.95 145.36	21 41 22.3
10	1 07 16.48 136.05	12 34 00.1	10	2 59 56.31 145.52	21 50 04.8
11	1 09 32.53 136.24	12 47 58.7	11	3 02 21.83 145.67	21 58 38.9
12	1 11 48.77 136.43	13 01 52.6	12	3 04 47.50 145.82	22 07 04.4
13	1 14 05.20 136.64	13 15 41.6	13	3 07 13.32 145.97	22 15 21.4
14	1 16 21.84 136.83	13 29 25.7	14	3 09 39.29 146.11	22 23 29.7
15	1 18 38.67 137.03	13 43 04.7	15	3 12 05.40 146.24	22 31 29.3
16	1 20 55.70 137.24	13 56 38.6	16	3 14 31.64 146.37	22 39 20.1
17	1 23 12.94 137.44	14 10 07.4	17	3 16 58.01 146.51	22 47 02.2
18	1 25 30.38 137.64	14 23 30.8	18	3 19 24.52 146.62	22 54 35.4
19	1 27 48.02 137.84	14 36 48.8	19	3 21 51.14 146.74	23 01 59.8
20	1 30 05.86 138.06	14 50 01.3	20	3 24 17.88 146.86	23 09 15.3
21	1 32 23.92 138.26	15 03 08.2	21	3 26 44.74 146.96	23 16 21.8
22	1 34 42.18 138.47	15 16 09.4	22	3 29 11.70 147.07	23 23 19.3
23	1 37 00.65 138.68	+15 29 04.9	23	3 31 38.77 147.16	+23 30 07.7
		+769.6			+399.4
Thursday, May 2			Saturday, May 4		
0	1 39 19.33 138.89	+15 41 54.5	0	3 34 05.93 ^h 147.26	+23 36 47.1
1	1 41 38.22 139.10	15 54 38.2	1	3 36 33.19 147.34	23 43 17.4
2	1 43 57.32 139.31	16 07 15.9	2	3 39 00.53 147.42	23 49 38.5
3	1 46 16.63 139.53	16 19 47.4	3	3 41 27.95 147.50	23 55 50.4
4	1 48 36.16 139.74	16 32 12.7	4	3 43 55.45 147.57	24 01 53.1
5	1 50 55.90 139.94	16 44 31.7	5	3 46 23.02 147.64	24 07 46.5
6	1 53 15.84 140.16	16 56 44.4	6	3 48 50.66 147.69	24 13 30.7
7	1 55 36.00 140.37	17 08 50.5	7	3 51 18.35 147.74	24 19 05.7
8	1 57 56.37 140.58	17 20 50.2	8	3 53 46.09 147.79	24 24 31.3
9	2 00 16.95 140.79	17 32 43.2	9	3 56 13.88 147.83	24 29 47.5
10	2 02 37.74 140.99	17 44 29.5	10	3 58 41.71 147.87	24 34 54.4
11	2 04 58.73 141.21	17 56 09.0	11	4 01 09.58 147.89	24 39 51.9
12	2 07 19.94 141.41	18 07 41.6	12	4 03 37.47 147.92	24 44 40.0
13	2 09 41.35 141.63	18 19 07.3	13	4 06 05.39 147.93	24 49 18.7
14	2 12 02.98 141.83	18 30 25.9	14	4 08 33.32 147.94	24 53 48.0
15	2 14 24.81 142.03	18 41 37.3	15	4 11 01.26 147.95	24 58 07.8
16	2 16 46.84 142.24	18 52 41.6	16	4 13 29.21 147.94	25 02 18.2
17	2 19 09.08 142.44	19 03 38.6	17	4 15 57.15 147.91	25 06 19.2
18	2 21 31.52 142.64	19 14 28.3	18	4 18 25.08 147.91	25 10 10.6
19	2 23 54.16 142.84	19 25 10.5	19	4 20 52.99 147.89	25 13 52.6
20	2 26 17.00 143.03	19 35 45.2	20	4 23 20.88 147.86	25 17 25.2
21	2 28 40.03 143.23	19 46 12.4	21	4 25 48.74 147.82	25 20 48.2
22	2 31 03.26 143.43	19 56 31.9	22	4 28 16.56 147.79	25 24 01.8
23	2 33 26.69 143.61	20 06 43.7	23	4 30 44.35 147.73	25 27 05.9
24	2 35 50.30 143.61	+20 16 47.7	24	4 33 12.08 147.73	+25 30 00.5
		+604.0			+174.6

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Sunday, May 5					Tuesday, May 7				
0	4 33	12.08	+25 30	00.5	0	6 28	22.68	+24 51	12.4
1	4 35	39.76	25 32	45.7	1	6 30	40.69	24 46	56.4
2	4 38	07.37	25 35	21.3	2	6 32	58.39	24 42	32.8
3	4 40	34.91	25 37	47.6	3	6 35	15.78	24 38	01.6
4	4 43	02.38	25 40	04.4	4	6 37	32.84	24 33	23.0
5	4 45	29.77	25 42	11.7	5	6 39	49.59	24 28	36.9
6	4 47	57.07	25 44	09.6	6	6 42	06.01	24 23	43.4
7	4 50	24.27	25 45	58.1	7	6 44	22.11	24 18	42.6
8	4 52	51.36	25 47	37.3	8	6 46	37.89	24 13	34.5
9	4 55	18.35	25 49	07.0	9	6 48	53.33	24 08	19.3
10	4 57	45.23	25 50	27.4	10	6 51	08.45	24 02	56.9
11	5 00	11.98	25 51	38.5	11	6 53	23.23	23 57	27.5
12	5 02	38.60	25 52	40.2	12	6 55	37.68	23 51	51.0
13	5 05	05.09	25 53	32.7	13	6 57	51.80	23 46	07.6
14	5 07	31.43	25 54	15.8	14	7 00	05.58	23 40	17.4
15	5 09	57.63	25 54	49.8	15	7 02	19.02	23 34	20.3
16	5 12	23.68	25 55	14.5	16	7 04	32.12	23 28	16.5
17	5 14	49.56	25 55	30.1	17	7 06	44.88	23 22	06.0
18	5 17	15.28	25 55	36.5	18	7 08	57.30	23 15	48.8
19	5 19	40.83	25 55	33.8	19	7 11	09.38	23 09	25.1
20	5 22	06.20	25 55	22.0	20	7 13	21.12	23 02	54.9
21	5 24	31.39	25 55	01.1	21	7 15	32.52	22 56	18.3
22	5 26	56.38	25 54	31.3	22	7 17	43.58	22 49	35.3
23	5 29	21.18	+25 53	52.4	23	7 19	54.29	+22 42	46.0
		144.60		-47.8			130.37		-415.5
Monday, May 6					Wednesday, May 8				
0	5 31	45.78	+25 53	04.6	0	7 22	04.66	+22 35	50.5
1	5 34	10.17	25 52	07.9	1	7 24	14.69	22 28	48.8
2	5 36	34.35	25 51	02.3	2	7 26	24.37	22 21	41.0
3	5 38	58.32	25 49	47.9	3	7 28	33.71	22 14	27.1
4	5 41	22.05	25 48	24.8	4	7 30	42.71	22 07	07.3
5	5 43	45.56	25 46	52.9	5	7 32	51.37	21 59	41.5
6	5 46	08.84	25 45	12.3	6	7 34	59.68	21 52	09.9
7	5 48	31.88	25 43	23.0	7	7 37	07.66	21 44	32.4
8	5 50	54.67	25 41	25.2	8	7 39	15.29	21 36	49.3
9	5 53	17.22	25 39	18.8	9	7 41	22.59	21 29	00.4
10	5 55	39.51	25 37	04.0	10	7 43	29.54	21 21	06.0
11	5 58	01.55	25 34	40.6	11	7 45	36.16	21 13	06.0
12	6 00	23.32	25 32	08.9	12	7 47	42.44	21 05	00.5
13	6 02	44.83	25 29	28.8	13	7 49	48.39	20 56	49.6
14	6 05	06.06	25 26	40.5	14	7 51	54.00	20 48	33.3
15	6 07	27.02	25 23	43.9	15	7 53	59.28	20 40	11.7
16	6 09	47.70	25 20	39.1	16	7 56	04.23	20 31	44.9
17	6 12	08.10	25 17	26.1	17	7 58	08.84	20 23	12.9
18	6 14	28.21	25 14	05.1	18	8 00	13.13	20 14	35.8
19	6 16	48.03	25 10	36.1	19	8 02	17.09	20 05	53.6
20	6 19	07.56	25 06	59.0	20	8 04	20.73	19 57	06.4
21	6 21	26.80	25 03	14.1	21	8 06	24.04	19 48	14.3
22	6 23	45.73	24 59	21.3	22	8 08	27.03	19 39	17.2
23	6 26	04.36	24 55	20.7	23	8 10	29.71	19 30	15.4
24	6 28	22.68	+24 51	12.4	24	8 12	32.06	+19 21	08.8
		138.32		-248.3			122.35		-546.6

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Thursday, May 9			Saturday, May 11		
0	8 12 32.06 122.04	+19 21 08.8	0	9 45 04.78 110.34	+10 47 58.7
1	8 14 34.10 121.73	19 11 57.5	1	9 46 55.12 110.18	10 36 02.5
2	8 16 35.83 121.41	19 02 41.5	2	9 48 45.30 110.02	10 24 03.9
3	8 18 37.24 121.10	18 53 21.0	3	9 50 35.32 109.88	10 12 03.1
4	8 20 38.34 120.80	18 43 55.9	4	9 52 25.20 109.72	10 00 00.1
5	8 22 39.14 120.50	18 34 26.3	5	9 54 14.92 109.59	9 47 54.9
6	8 24 39.64 120.19	18 24 52.3	6	9 56 04.51 109.45	9 35 47.5
7	8 26 39.83 119.89	18 15 13.9	7	9 57 53.96 109.32	9 23 38.1
8	8 28 39.72 119.60	18 05 31.2	8	9 59 43.28 109.18	9 11 26.5
9	8 30 39.32 119.30	17 55 44.3	9	10 01 32.46 109.06	8 59 13.0
10	8 32 38.62 119.02	17 45 53.1	10	10 03 21.52 108.94	8 46 57.5
11	8 34 37.64 118.72	17 35 57.8	11	10 05 10.46 108.82	8 34 40.1
12	8 36 36.36 118.44	17 25 58.4	12	10 06 59.28 108.71	8 22 20.7
13	8 38 34.80 118.15	17 15 55.0	13	10 08 47.99 108.59	8 09 59.5
14	8 40 32.95 117.88	17 05 47.6	14	10 10 36.58 108.49	7 57 36.5
15	8 42 30.83 117.60	16 55 36.2	15	10 12 25.07 108.39	7 45 11.7
16	8 44 28.43 117.32	16 45 21.0	16	10 14 13.46 108.29	7 32 45.1
17	8 46 25.75 117.05	16 35 01.9	17	10 16 01.75 108.20	7 20 16.8
18	8 48 22.80 116.78	16 24 39.1	18	10 17 49.95 108.11	7 07 46.9
19	8 50 19.58 116.52	16 14 12.5	19	10 19 38.06 108.02	6 55 15.4
20	8 52 16.10 116.26	16 03 42.2	20	10 21 26.08 107.94	6 42 42.2
21	8 54 12.36 116.00	15 53 08.4	21	10 23 14.02 107.86	6 30 07.5
22	8 56 08.36 115.74	15 42 30.9	22	10 25 01.88 107.79	6 17 31.3
23	8 58 04.10 115.49	+15 31 49.9	23	10 26 49.67 107.72	+6 04 53.6
		-644.4			-759.1
Friday, May 10			Sunday, May 12		
0	8 59 59.59 115.24	+15 21 05.5	0	10 28 37.39 107.66	+5 52 14.5
1	9 01 54.83 115.00	15 10 17.6	1	10 30 25.05 107.59	5 39 34.0
2	9 03 49.83 114.75	14 59 26.4	2	10 32 12.64 107.54	5 26 52.1
3	9 05 44.58 114.52	14 48 31.8	3	10 34 00.18 107.48	5 14 08.9
4	9 07 39.10 114.28	14 37 34.0	4	10 35 47.66 107.44	5 01 24.5
5	9 09 33.38 114.05	14 26 32.9	5	10 37 35.10 107.39	4 48 38.8
6	9 11 27.43 113.82	14 15 28.6	6	10 39 22.49 107.35	4 35 51.9
7	9 13 21.25 113.59	14 04 21.2	7	10 41 09.84 107.32	4 23 03.8
8	9 15 14.84 113.38	13 53 10.7	8	10 42 57.16 107.28	4 10 14.6
9	9 17 08.22 113.16	13 41 57.1	9	10 44 44.44 107.26	3 57 24.3
10	9 19 01.38 112.94	13 30 40.6	10	10 46 31.70 107.23	3 44 32.9
11	9 20 54.32 112.73	13 19 21.0	11	10 48 18.93 107.21	3 31 40.6
12	9 22 47.05 112.53	13 07 58.6	12	10 50 06.14 107.20	3 18 47.2
13	9 24 39.58 112.32	12 56 33.3	13	10 51 53.34 107.19	3 05 52.9
14	9 26 31.90 112.12	12 45 05.2	14	10 53 40.53 107.18	2 52 57.7
15	9 28 24.02 111.93	12 33 34.3	15	10 55 27.71 107.17	2 40 01.7
16	9 30 15.95 111.74	12 22 00.7	16	10 57 14.88 107.18	2 27 04.8
17	9 32 07.69 111.54	12 10 24.4	17	10 59 02.06 107.18	2 14 07.2
18	9 33 59.23 111.37	11 58 45.5	18	11 00 49.24 107.19	2 01 08.8
19	9 35 50.60 111.18	11 47 03.9	19	11 02 36.43 107.21	1 48 09.7
20	9 37 41.78 111.01	11 35 19.8	20	11 04 23.64 107.22	1 35 09.9
21	9 39 32.79 110.83	11 23 33.2	21	11 06 10.86 107.25	1 22 09.5
22	9 41 23.62 110.66	11 11 44.1	22	11 07 58.11 107.28	1 09 08.5
23	9 43 14.28 110.50	10 59 52.6	23	11 09 45.39 107.30	0 56 06.9
24	9 45 04.78	+10 47 58.7	24	11 11 32.69	+0 43 04.8
		-713.9			-782.1

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Monday, May 13			Wednesday, May 15		
0	11 11 32.69 107.34	+ 0 43 04.8 -782.5	0	12 39 21.91 113.94	- 9 38 55.2 -754.2
1	11 13 20.03 107.38	0 30 02.3 783.0	1	12 41 15.85 114.18	9 51 29.4 752.3
2	11 15 07.41 107.43	0 16 59.3 783.4	2	12 43 10.03 114.42	10 04 01.7 750.5
3	11 16 54.84 107.47	+ 0 03 55.9 783.7	3	12 45 04.45 114.67	10 16 32.2 748.6
4	11 18 42.31 107.52	- 0 09 07.8 784.1	4	12 46 59.12 114.92	10 29 00.8 746.7
5	11 20 29.83 107.58	0 22 11.9 784.3	5	12 48 54.04 115.17	10 41 27.5 744.5
6	11 22 17.41 107.64	0 35 16.2 784.6	6	12 50 49.21 115.42	10 53 52.0 742.5
7	11 24 05.05 107.70	0 48 20.8 784.7	7	12 52 44.63 115.69	11 06 14.5 740.4
8	11 25 52.75 107.77	1 01 25.5 784.9	8	12 54 40.32 115.95	11 18 34.9 738.1
9	11 27 40.52 107.85	1 14 30.4 785.1	9	12 56 36.27 116.22	11 30 53.0 735.9
10	11 29 28.37 107.92	1 27 35.5 785.1	10	12 58 32.49 116.49	11 43 08.9 733.5
11	11 31 16.29 108.01	1 40 40.6 785.1	11	13 00 28.98 116.77	11 55 22.4 731.2
12	11 33 04.30 108.09	1 53 45.7 785.1	12	13 02 25.75 117.05	12 07 33.6 728.7
13	11 34 52.39 108.18	2 06 50.8 785.1	13	13 04 22.80 117.32	12 19 42.3 726.2
14	11 36 40.57 108.27	2 19 55.9 785.0	14	13 06 20.12 117.62	12 31 48.5 723.6
15	11 38 28.84 108.38	2 33 00.9 784.8	15	13 08 17.74 117.90	12 43 52.1 721.0
16	11 40 17.22 108.47	2 46 05.7 784.7	16	13 10 15.64 118.20	12 55 53.1 718.3
17	11 42 05.69 108.58	2 59 10.4 784.4	17	13 12 13.84 118.49	13 07 51.4 715.5
18	11 43 54.27 108.69	3 12 14.8 784.1	18	13 14 12.33 118.79	13 19 46.9 712.7
19	11 45 42.96 108.80	3 25 18.9 783.9	19	13 16 11.12 119.10	13 31 39.6 709.8
20	11 47 31.76 108.93	3 38 22.8 783.4	20	13 18 10.22 119.40	13 43 29.4 706.8
21	11 49 20.69 109.05	3 51 26.2 783.1	21	13 20 09.62 119.72	13 55 16.2 703.8
22	11 51 09.74 109.17	4 04 29.3 782.6	22	13 22 09.34 120.03	14 07 00.0 700.7
23	11 52 58.91 109.31	- 4 17 31.9 -782.2	23	13 24 09.37 120.34	-14 18 40.7 -697.5
Tuesday, May 14			Thursday, May 16		
0	11 54 48.22 109.44	- 4 30 34.1 -781.6	0	13 26 09.71 120.66	-14 30 18.2 -694.3
1	11 56 37.66 109.59	4 43 35.7 781.0	1	13 28 10.37 120.98	14 41 52.5 691.0
2	11 58 27.25 109.73	4 56 36.7 780.4	2	13 30 11.35 121.31	14 53 23.5 687.6
3	12 00 16.98 109.88	5 09 37.1 779.8	3	13 32 12.66 121.64	15 04 51.1 684.2
4	12 02 06.86 110.03	5 22 36.9 779.0	4	13 34 14.30 121.97	15 16 15.3 680.7
5	12 03 56.89 110.18	5 35 35.9 778.2	5	13 36 16.27 122.31	15 27 36.0 677.1
6	12 05 47.07 110.35	5 48 34.1 777.5	6	13 38 18.58 122.64	15 38 53.1 673.4
7	12 07 37.42 110.51	6 01 31.6 776.5	7	13 40 21.22 122.98	15 50 06.5 669.7
8	12 09 27.93 110.68	6 14 28.1 775.7	8	13 42 24.20 123.32	16 01 16.2 665.9
9	12 11 18.61 110.86	6 27 23.8 774.7	9	13 44 27.52 123.67	16 12 22.1 662.0
10	12 13 09.47 111.03	6 40 18.5 773.7	10	13 46 31.19 124.02	16 23 24.1 658.1
11	12 15 00.50 111.21	6 53 12.2 772.6	11	13 48 35.21 124.36	16 34 22.2 654.1
12	12 16 51.71 111.40	7 06 04.8 771.5	12	13 50 39.57 124.72	16 45 16.3 650.0
13	12 18 43.11 111.59	7 18 56.3 770.4	13	13 52 44.29 125.07	16 56 06.3 645.9
14	12 20 34.70 111.78	7 31 46.7 769.2	14	13 54 49.36 125.43	17 06 52.2 641.6
15	12 22 26.48 111.98	7 44 35.9 767.9	15	13 56 54.79 125.79	17 17 33.8 637.3
16	12 24 18.46 112.18	7 57 23.8 766.5	16	13 59 00.58 126.15	17 28 11.1 632.9
17	12 26 10.64 112.39	8 10 10.3 765.3	17	14 01 06.73 126.51	17 38 44.0 628.4
18	12 28 03.03 112.60	8 22 55.6 763.8	18	14 03 13.24 126.88	17 49 12.4 623.8
19	12 29 55.63 112.81	8 35 39.4 762.3	19	14 05 20.12 127.24	17 59 36.2 619.3
20	12 31 48.44 113.03	8 48 21.7 760.8	20	14 07 27.36 127.61	18 09 55.5 614.5
21	12 33 41.47 113.25	9 01 02.5 759.2	21	14 09 34.97 127.98	18 20 10.0 609.8
22	12 35 34.72 113.48	9 13 41.7 757.6	22	14 11 42.95 128.35	18 30 19.8 605.0
23	12 37 28.20 113.71	9 26 19.3 755.9	23	14 13 51.30 128.73	18 40 24.8 600.0
24	12 39 21.91	- 9 38 55.2	24	14 16 00.03	-18 50 24.8

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Friday, May 17			Sunday, May 19		
0	^{h m s} 14 16 00.03	^{° ′ ″} -18 50 24.8	0	^{h m s} 16 06 17.38	^{° ′ ″} -24 47 46.5
1	14 18 09.13	19 00 19.8	1	16 08 43.67	24 52 08.2
2	14 20 18.61	19 10 09.7	2	16 11 10.25	24 56 21.1
3	14 22 28.47	19 19 54.5	3	16 13 37.10	25 00 25.3
4	14 24 38.70	19 29 34.0	4	16 16 04.23	25 04 20.5
5	14 26 49.31	19 39 08.1	5	16 18 31.62	25 08 06.9
6	14 29 00.31	19 48 36.9	6	16 20 59.28	25 11 44.2
7	14 31 11.68	19 58 00.2	7	16 23 27.19	25 15 12.5
8	14 33 23.43	20 07 17.9	8	16 25 55.36	25 18 31.8
9	14 35 35.57	20 16 29.9	9	16 28 23.76	25 21 41.9
10	14 37 48.09	20 25 36.3	10	16 30 52.40	25 24 42.8
11	14 40 00.99	20 34 36.8	11	16 33 21.27	25 27 34.4
12	14 42 14.27	20 43 31.5	12	16 35 50.37	25 30 16.8
13	14 44 27.93	20 52 20.2	13	16 38 19.68	25 32 49.8
14	14 46 41.98	21 01 02.8	14	16 40 49.21	25 35 13.4
15	14 48 56.41	21 09 39.3	15	16 43 18.94	25 37 27.6
16	14 51 11.23	21 18 09.6	16	16 45 48.86	25 39 32.3
17	14 53 26.42	21 26 33.6	17	16 48 18.98	25 41 27.5
18	14 55 41.99	21 34 51.3	18	16 50 49.28	25 43 13.1
19	14 57 57.95	21 43 02.5	19	16 53 19.75	25 44 49.1
20	15 00 14.28	21 51 07.1	20	16 55 50.39	25 46 15.5
21	15 02 30.99	21 59 05.1	21	16 58 21.19	25 47 32.3
22	15 04 48.08	22 06 56.5	22	17 00 52.14	25 48 39.3
23	15 07 05.54	-22 14 41.0	23	17 03 23.24	-25 49 36.6
Saturday, May 18			Monday, May 20		
0	15 09 23.38	-22 22 18.7	0	17 05 54.48	-25 50 24.1
1	15 11 41.59	22 29 49.5	1	17 08 25.85	25 51 01.9
2	15 14 00.17	22 37 13.2	2	17 10 57.34	25 51 29.8
3	15 16 19.12	22 44 29.9	3	17 13 28.94	25 51 47.9
4	15 18 38.44	22 51 39.4	4	17 16 00.65	25 51 56.1
5	15 20 58.12	22 58 41.6	5	17 18 32.46	25 51 54.4
6	15 23 18.17	23 05 36.5	6	17 21 04.36	25 51 42.8
7	15 25 38.57	23 12 24.0	7	17 23 36.35	25 51 21.4
8	15 27 59.33	23 19 04.0	8	17 26 08.40	25 50 50.0
9	15 30 20.45	23 25 36.5	9	17 28 40.53	25 50 08.7
10	15 32 41.91	23 32 01.3	10	17 31 12.71	25 49 17.4
11	15 35 03.73	23 38 18.4	11	17 33 44.95	25 48 16.1
12	15 37 25.89	23 44 27.8	12	17 36 17.23	25 47 04.9
13	15 39 48.39	23 50 29.3	13	17 38 49.54	25 45 43.7
14	15 42 11.23	23 56 22.8	14	17 41 21.89	25 44 12.6
15	15 44 34.41	24 02 08.4	15	17 43 54.25	25 42 31.4
16	15 46 57.92	24 07 45.9	16	17 46 26.62	25 40 40.3
17	15 49 21.75	24 13 15.2	17	17 48 58.99	25 38 39.1
18	15 51 45.91	24 18 36.3	18	17 51 31.36	25 36 28.0
19	15 54 10.39	24 23 49.1	19	17 54 03.72	25 34 07.0
20	15 56 35.18	24 28 53.6	20	17 56 36.06	25 31 36.0
21	15 59 00.27	24 33 49.6	21	17 59 08.37	25 28 55.1
22	16 01 25.68	24 38 37.2	22	18 01 40.65	25 26 04.2
23	16 03 51.38	24 43 16.1	23	18 04 12.88	25 23 03.4
24	16 06 17.38	-24 47 46.5	24	18 06 45.06	-25 19 52.7

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Tuesday, May 21			Thursday, May 23		
0	^{h m s} 18 06 45.06 ^s 152.12	^{° ′ ″} -25 19 52.7 [″] +200.6	0	^{h m s} 20 05 27.96 ^s 142.77	^{° ′ ″} -19 45 30.7 [″] +622.4
1	18 09 17.18 152.06	25 16 32.1 210.4	1	20 07 50.73 142.49	19 35 08.3 629.6
2	18 11 49.24 151.99	25 13 01.7 220.3	2	20 10 13.22 142.22	19 24 38.7 636.7
3	18 14 21.23 151.90	25 09 21.4 230.2	3	20 12 35.44 141.94	19 14 02.0 643.7
4	18 16 53.13 151.81	25 05 31.2 239.9	4	20 14 57.38 141.67	19 03 18.3 650.6
5	18 19 24.94 151.72	25 01 31.3 249.7	5	20 17 19.05 141.40	18 52 27.7 657.5
6	18 21 56.66 151.62	24 57 21.6 259.4	6	20 19 40.45 141.13	18 41 30.2 664.2
7	18 24 28.28 151.52	24 53 02.2 269.1	7	20 22 01.58 140.84	18 30 26.0 671.0
8	18 26 59.80 151.39	24 48 33.1 278.8	8	20 24 22.42 140.58	18 19 15.0 677.5
9	18 29 31.19 151.28	24 43 54.3 288.4	9	20 26 43.00 140.30	18 07 57.5 684.0
10	18 32 02.47 151.14	24 39 05.9 298.1	10	20 29 03.30 140.03	17 56 33.5 690.5
11	18 34 33.61 151.01	24 34 07.8 307.6	11	20 31 23.33 139.75	17 45 03.0 696.8
12	18 37 04.62 150.87	24 29 00.2 317.2	12	20 33 43.08 139.48	17 33 26.2 703.1
13	18 39 35.49 150.72	24 23 43.0 326.6	13	20 36 02.56 139.21	17 21 43.1 709.2
14	18 42 06.21 150.56	24 18 16.4 336.1	14	20 38 21.77 138.94	17 09 53.9 715.4
15	18 44 36.77 150.41	24 12 40.3 345.5	15	20 40 40.71 138.67	16 57 58.5 721.3
16	18 47 07.18 150.24	24 06 54.8 354.8	16	20 42 59.38 138.40	16 45 57.2 727.3
17	18 49 37.42 150.07	24 01 00.0 364.2	17	20 45 17.78 138.14	16 33 49.9 733.2
18	18 52 07.49 149.90	23 54 55.8 373.4	18	20 47 35.92 137.87	16 21 36.7 738.8
19	18 54 37.39 149.71	23 48 42.4 382.6	19	20 49 53.79 137.61	16 09 17.9 744.6
20	18 57 07.10 149.53	23 42 19.8 391.8	20	20 52 11.40 137.35	15 56 53.3 750.1
21	18 59 36.63 149.33	23 35 48.0 400.8	21	20 54 28.75 137.08	15 44 23.2 755.6
22	19 02 05.96 149.14	23 29 07.2 410.0	22	20 56 45.83 136.83	15 31 47.6 761.0
23	19 04 35.10 148.93	-23 22 17.2 +418.9	23	20 59 02.66 136.57	-15 19 06.6 +766.3
Wednesday, May 22			Friday, May 24		
0	19 07 04.03 148.73	-23 15 18.3 +427.9	0	21 01 19.23 136.32	-15 06 20.3 +771.6
1	19 09 32.76 148.51	23 08 10.4 436.7	1	21 03 35.55 136.06	14 53 28.7 776.7
2	19 12 01.27 148.30	23 00 53.7 445.6	2	21 05 51.61 135.82	14 40 32.0 781.7
3	19 14 29.57 148.08	22 53 28.1 454.3	3	21 08 07.43 135.57	14 27 30.3 786.8
4	19 16 57.65 147.85	22 45 53.8 463.1	4	21 10 23.00 135.32	14 14 23.5 791.6
5	19 19 25.50 147.63	22 38 10.7 471.6	5	21 12 38.32 135.09	14 01 11.9 796.4
6	19 21 53.13 147.40	22 30 19.1 480.2	6	21 14 53.41 134.84	13 47 55.5 801.1
7	19 24 20.53 147.16	22 22 18.9 488.8	7	21 17 08.25 134.61	13 34 34.4 805.8
8	19 26 47.69 146.93	22 14 10.1 497.1	8	21 19 22.86 134.37	13 21 08.6 810.3
9	19 29 14.62 146.68	22 05 53.0 505.6	9	21 21 37.23 134.14	13 07 38.3 814.7
10	19 31 41.30 146.43	21 57 27.4 513.8	10	21 23 51.37 133.91	12 54 03.6 819.1
11	19 34 07.73 146.19	21 48 53.6 522.1	11	21 26 05.28 133.69	12 40 24.5 823.4
12	19 36 33.92 145.94	21 40 11.5 530.2	12	21 28 18.97 133.47	12 26 41.1 827.6
13	19 38 59.86 145.68	21 31 21.3 538.4	13	21 30 32.44 133.24	12 12 53.5 831.7
14	19 41 25.54 145.42	21 22 22.9 546.3	14	21 32 45.68 133.04	11 59 01.8 835.7
15	19 43 50.96 145.17	21 13 16.6 554.3	15	21 34 58.72 132.82	11 45 06.1 839.6
16	19 46 16.13 144.91	21 04 02.3 562.2	16	21 37 11.54 132.61	11 31 06.5 843.4
17	19 48 41.04 144.64	20 54 40.1 570.0	17	21 39 24.15 132.41	11 17 03.1 847.2
18	19 51 05.68 144.39	20 45 10.1 577.7	18	21 41 36.56 132.20	11 02 55.9 850.9
19	19 53 30.07 144.11	20 35 32.4 585.3	19	21 43 48.76 132.01	10 48 45.0 854.5
20	19 55 54.18 143.85	20 25 47.1 593.0	20	21 46 00.77 131.81	10 34 30.5 858.0
21	19 58 18.03 143.58	20 15 54.1 600.4	21	21 48 12.58 131.62	10 20 12.5 861.3
22	20 00 41.61 143.31	20 05 53.7 607.8	22	21 50 24.20 131.44	10 05 51.2 864.7
23	20 03 04.92 143.04	19 55 45.9 +615.2	23	21 52 35.64 131.25	9 51 26.5 +867.9
24	20 05 27.96	-19 45 30.7	24	21 54 46.89	-9 36 58.6

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Saturday, May 25			Monday, May 27		
0	^h 21 ^m 54 ^s 46.89 [°] 131.08	- 9 36 58.6 [°] +871.1	0	^h 23 ^m 37 ^s 36.34 [°] 127.66	+ 2 32 58.6 [°] +922.6
1	21 56 57.97 [°] 130.90	9 22 27.5 [°] 874.1	1	23 39 44.00 [°] 127.71	2 48 21.2 [°] 921.6
2	21 59 08.87 [°] 130.73	9 07 53.4 [°] 877.1	2	23 41 51.71 [°] 127.75	3 03 42.8 [°] 920.5
3	22 01 19.60 [°] 130.56	8 53 16.3 [°] 880.0	3	23 43 59.46 [°] 127.80	3 19 03.3 [°] 919.4
4	22 03 30.16 [°] 130.40	8 38 36.3 [°] 882.8	4	23 46 07.26 [°] 127.85	3 34 22.7 [°] 918.2
5	22 05 40.56 [°] 130.24	8 23 53.5 [°] 885.5	5	23 48 15.11 [°] 127.92	3 49 40.9 [°] 916.8
6	22 07 50.80 [°] 130.09	8 09 08.0 [°] 888.2	6	23 50 23.03 [°] 127.98	4 04 57.7 [°] 915.4
7	22 10 00.89 [°] 129.94	7 54 19.8 [°] 890.7	7	23 52 31.01 [°] 128.05	4 20 13.1 [°] 914.0
8	22 12 10.83 [°] 129.79	7 39 29.1 [°] 893.2	8	23 54 39.06 [°] 128.12	4 35 27.1 [°] 912.4
9	22 14 20.62 [°] 129.65	7 24 35.9 [°] 895.5	9	23 56 47.18 [°] 128.20	4 50 39.5 [°] 910.7
10	22 16 30.27 [°] 129.51	7 09 40.4 [°] 897.9	10	23 58 55.38 [°] 128.28	5 05 50.2 [°] 909.0
11	22 18 39.78 [°] 129.37	6 54 42.5 [°] 900.0	11	0 01 03.66 [°] 128.36	5 20 59.2 [°] 907.2
12	22 20 49.15 [°] 129.25	6 39 42.5 [°] 902.2	12	0 03 12.02 [°] 128.45	5 36 06.4 [°] 905.3
13	22 22 58.40 [°] 129.13	6 24 40.3 [°] 904.2	13	0 05 20.47 [°] 128.55	5 51 11.7 [°] 903.3
14	22 25 07.53 [°] 129.00	6 09 36.1 [°] 906.2	14	0 07 29.02 [°] 128.65	6 06 15.0 [°] 901.2
15	22 27 16.53 [°] 128.89	5 54 29.9 [°] 908.0	15	0 09 37.67 [°] 128.75	6 21 16.2 [°] 899.0
16	22 29 25.42 [°] 128.78	5 39 21.9 [°] 909.9	16	0 11 46.42 [°] 128.85	6 36 15.2 [°] 896.8
17	22 31 34.20 [°] 128.67	5 24 12.0 [°] 911.5	17	0 13 55.27 [°] 128.97	6 51 12.0 [°] 894.5
18	22 33 42.87 [°] 128.57	5 09 00.5 [°] 913.1	18	0 16 04.24 [°] 129.08	7 06 06.5 [°] 892.1
19	22 35 51.44 [°] 128.47	4 53 47.4 [°] 914.7	19	0 18 13.32 [°] 129.20	7 20 58.6 [°] 889.6
20	22 37 59.91 [°] 128.38	4 38 32.7 [°] 916.1	20	0 20 22.52 [°] 129.32	7 35 48.2 [°] 887.0
21	22 40 08.29 [°] 128.29	4 23 16.6 [°] 917.5	21	0 22 31.84 [°] 129.45	7 50 35.2 [°] 884.3
22	22 42 16.58 [°] 128.20	4 07 59.1 [°] 918.8	22	0 24 41.29 [°] 129.58	8 05 19.5 [°] 881.6
23	22 44 24.78 [°] 128.13	- 3 52 40.3 [°] +919.9	23	0 26 50.87 [°] 129.71	+ 8 20 01.1 [°] +878.8
Sunday, May 26			Tuesday, May 28		
0	22 46 32.91 [°] 128.05	- 3 37 20.4 [°] +921.1	0	0 29 00.58 [°] 129.85	+ 8 34 39.9 [°] +875.8
1	22 48 40.96 [°] 127.99	3 21 59.3 [°] 922.0	1	0 31 10.43 [°] 129.99	8 49 15.7 [°] 872.9
2	22 50 48.95 [°] 127.91	3 06 37.3 [°] 923.0	2	0 33 20.42 [°] 130.14	9 03 48.6 [°] 869.7
3	22 52 56.86 [°] 127.86	2 51 14.3 [°] 923.9	3	0 35 30.56 [°] 130.28	9 18 18.3 [°] 866.6
4	22 55 04.72 [°] 127.80	2 35 50.4 [°] 924.7	4	0 37 40.84 [°] 130.44	9 32 44.9 [°] 863.3
5	22 57 12.52 [°] 127.75	2 20 25.7 [°] 925.3	5	0 39 51.28 [°] 130.59	9 47 08.2 [°] 860.0
6	22 59 20.27 [°] 127.71	2 05 00.4 [°] 926.0	6	0 42 01.87 [°] 130.75	10 01 28.2 [°] 856.5
7	23 01 27.98 [°] 127.66	1 49 34.4 [°] 926.5	7	0 44 12.62 [°] 130.92	10 15 44.7 [°] 853.1
8	23 03 35.64 [°] 127.62	1 34 07.9 [°] 926.9	8	0 46 23.54 [°] 131.08	10 29 57.8 [°] 849.4
9	23 05 43.26 [°] 127.60	1 18 41.0 [°] 927.2	9	0 48 34.62 [°] 131.25	10 44 07.2 [°] 845.8
10	23 07 50.86 [°] 127.56	1 03 13.8 [°] 927.6	10	0 50 45.87 [°] 131.42	10 58 13.0 [°] 842.0
11	23 09 58.42 [°] 127.54	0 47 46.2 [°] 927.7	11	0 52 57.29 [°] 131.60	11 12 15.0 [°] 838.2
12	23 12 05.96 [°] 127.52	0 32 18.5 [°] 927.8	12	0 55 08.89 [°] 131.78	11 26 13.2 [°] 834.3
13	23 14 13.48 [°] 127.51	0 16 50.7 [°] 927.9	13	0 57 20.67 [°] 131.95	11 40 07.5 [°] 830.2
14	23 16 20.99 [°] 127.50	- 0 01 22.8 [°] 927.8	14	0 59 32.62 [°] 132.14	11 53 57.7 [°] 826.1
15	23 18 28.49 [°] 127.50	+ 0 14 05.0 [°] 927.7	15	1 01 44.76 [°] 132.33	12 07 43.8 [°] 822.0
16	23 20 35.99 [°] 127.49	0 29 32.7 [°] 927.4	16	1 03 57.09 [°] 132.51	12 21 25.8 [°] 817.7
17	23 22 43.48 [°] 127.50	0 45 00.1 [°] 927.1	17	1 06 09.60 [°] 132.71	12 35 03.5 [°] 813.3
18	23 24 50.98 [°] 127.51	1 00 27.2 [°] 926.7	18	1 08 22.31 [°] 132.90	12 48 36.8 [°] 808.9
19	23 26 58.49 [°] 127.52	1 15 53.9 [°] 926.2	19	1 10 35.21 [°] 133.10	13 02 05.7 [°] 804.3
20	23 29 06.01 [°] 127.55	1 31 20.1 [°] 925.7	20	1 12 48.31 [°] 133.30	13 15 30.0 [°] 799.8
21	23 31 13.56 [°] 127.56	1 46 45.8 [°] 925.0	21	1 15 01.61 [°] 133.50	13 28 49.8 [°] 795.1
22	23 33 21.12 [°] 127.59	2 02 10.8 [°] 924.3	22	1 17 15.11 [°] 133.71	13 42 04.9 [°] 790.3
23	23 35 28.71 [°] 127.63	2 17 35.1 [°] +923.5	23	1 19 28.82 [°] 133.91	13 55 15.2 [°] +785.4
24	23 37 36.34 [°]	+ 2 32 58.6 [°]	24	1 21 42.73 [°]	+ 14 08 20.6 [°]

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Wednesday, May 29					Friday, May 31				
0	h	m	s		0	h	m	s	
1	1 21	42.73	134.12	+14 08 20.6	1	3 13	07.67	144.31	+22 35 40.7
2	1 23	56.85	134.33	+780.5	2	3 15	31.98	144.47	+453.3
3	1 26	11.18	134.54	775.5	3	3 17	56.45	144.64	444.9
4	1 28	25.72	134.75	770.4	4	3 20	21.09	144.79	436.4
5	1 30	40.47	134.97	765.2	5	3 22	45.88	144.95	427.9
6	1 32	55.44	135.19	759.9	6	3 25	10.83	144.95	419.3
7	1 35	10.63	135.41	754.6	7	3 27	35.92	145.09	410.7
8	1 37	26.04	135.62	749.1	8	3 30	01.15	145.23	402.0
9	1 39	41.66	135.85	743.6	9	3 32	26.52	145.37	393.3
10	1 41	57.51	136.06	738.1	10	3 34	52.03	145.51	384.6
11	1 44	13.57	136.29	732.3	11	3 37	17.66	145.63	375.8
12	1 46	29.86	136.52	726.6	12	3 39	43.42	145.76	366.9
13	1 48	46.38	136.74	720.8	13	3 42	09.30	145.88	358.1
14	1 51	03.12	136.96	714.8	14	3 44	35.29	145.99	349.2
15	1 53	20.08	137.19	708.9	15	3 47	01.39	146.10	340.3
16	1 55	37.27	137.42	702.8	16	3 49	27.59	146.20	331.2
17	1 57	54.69	137.64	696.6	17	3 51	53.88	146.29	322.3
18	2 00	12.33	137.87	690.4	18	3 54	20.27	146.39	313.3
19	2 02	30.20	138.10	684.0	19	3 56	46.74	146.47	304.2
20	2 04	48.30	138.33	677.7	20	3 59	13.29	146.55	295.1
21	2 07	06.63	138.55	671.3	21	4 01	39.91	146.62	286.0
22	2 09	25.18	138.78	664.7	22	4 04	06.60	146.69	276.8
23	2 11	43.96	139.00	658.0	23	4 06	33.36	146.76	267.8
	2 14	02.96	139.23	651.4		4 09	00.16	146.80	258.5
				+18 43 57.8				146.86	+24 52 38.6
				+644.6					+249.3
Thursday, May 30					Saturday, June 1				
0	2 16	22.19	139.45	+18 54 42.4	0	4 11	27.02	146.90	+24 56 47.9
1	2 18	41.64	139.68	19 05 20.2	1	4 13	53.92	146.93	+240.1
2	2 21	01.32	139.91	19 15 51.0	2	4 16	20.85	146.97	230.9
3	2 23	21.23	140.12	19 26 14.9	3	4 18	47.82	146.99	221.6
4	2 25	41.35	140.35	19 36 31.7	4	4 21	14.81	147.00	212.4
5	2 28	01.70	140.56	19 46 41.3	5	4 23	41.81	147.01	203.0
6	2 30	22.26	140.78	19 56 43.8	6	4 26	08.82	147.01	193.8
7	2 32	43.04	141.00	20 06 39.0	7	4 28	35.84	147.02	184.5
8	2 35	04.04	141.22	20 16 26.8	8	4 31	02.85	147.01	175.3
9	2 37	25.26	141.42	20 26 07.2	9	4 33	29.86	147.01	165.9
10	2 39	46.68	141.64	20 35 40.2	10	4 35	56.84	146.98	155.6
11	2 42	08.32	141.85	20 45 05.6	11	4 38	23.81	146.97	147.3
12	2 44	30.17	142.05	20 54 23.4	12	4 40	50.74	146.93	138.0
13	2 46	52.22	142.26	21 03 33.5	13	4 43	17.64	146.90	128.7
14	2 49	14.48	142.46	21 12 35.9	14	4 45	44.49	146.85	119.4
15	2 51	36.94	142.66	21 21 30.5	15	4 48	11.29	146.80	110.1
16	2 53	59.60	142.86	21 30 17.2	16	4 48	11.29	146.75	100.8
17	2 56	22.46	143.05	21 38 56.0	17	4 50	38.04	146.68	91.5
18	2 58	45.51	143.24	21 47 26.8	18	4 53	04.72	146.61	82.3
19	3 01	08.75	143.42	21 55 49.6	19	4 55	31.33	146.53	73.0
20	3 03	32.17	143.61	22 04 04.2	20	4 57	57.86	146.44	63.8
21	3 05	55.78	143.79	22 12 10.7	21	5 00	24.30	146.36	54.5
22	3 08	19.57	143.96	22 20 09.0	22	5 02	50.66	146.26	45.4
23	3 10	43.53	144.14	22 27 59.0	23	5 05	16.92	146.15	36.1
24	3 13	07.67		+22 35 40.7	24	5 07	43.07	146.04	25 49 42.9
						5 10	09.11		+25 50 09.8

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Sunday, June 2					Tuesday, June 4				
0	5 10 09.11	145.92	+25 50 09.8	+17.8	0	7 02 54.60	134.01	+23 23 36.8	-373.1
1	5 12 35.03	145.80	25 50 27.6	+ 8.6	1	7 05 08.61	133.68	23 17 23.7	379.9
2	5 15 00.83	145.66	25 50 36.2	- 0.5	2	7 07 22.29	133.34	23 11 03.8	386.6
3	5 17 26.49	145.53	25 50 35.7	9.5	3	7 09 35.63	133.00	23 04 37.2	393.2
4	5 19 52.02	145.38	25 50 26.2	18.6	4	7 11 48.63	132.67	22 58 04.0	399.7
5	5 22 17.40	145.23	25 50 07.6	27.7	5	7 14 01.30	132.33	22 51 24.3	406.3
6	5 24 42.63	145.08	25 49 39.9	36.6	6	7 16 13.63	131.99	22 44 38.0	412.7
7	5 27 07.71	144.91	25 49 03.3	45.6	7	7 18 25.62	131.64	22 37 45.3	419.1
8	5 29 32.62	144.75	25 48 17.7	54.5	8	7 20 37.26	131.31	22 30 46.2	425.4
9	5 31 57.37	144.57	25 47 23.2	63.5	9	7 22 48.57	130.97	22 23 40.8	431.7
10	5 34 21.94	144.38	25 46 19.7	72.3	10	7 24 59.54	130.62	22 16 29.1	437.8
11	5 36 46.32	144.20	25 45 07.4	81.2	11	7 27 10.16	130.28	22 09 11.3	443.9
12	5 39 10.52	144.01	25 43 46.2	89.9	12	7 29 20.44	129.94	22 01 47.4	450.0
13	5 41 34.53	143.80	25 42 16.3	98.7	13	7 31 30.38	129.60	21 54 17.4	455.9
14	5 43 58.33	143.60	25 40 37.6	107.5	14	7 33 39.98	129.25	21 46 41.5	461.8
15	5 46 21.93	143.39	25 38 50.1	116.1	15	7 35 49.23	128.90	21 38 59.7	467.7
16	5 48 45.32	143.17	25 36 54.0	124.7	16	7 37 58.13	128.57	21 31 12.0	473.5
17	5 51 08.49	142.96	25 34 49.3	133.3	17	7 40 06.70	128.22	21 23 18.5	479.2
18	5 53 31.45	142.72	25 32 36.0	141.8	18	7 42 14.92	127.88	21 15 19.3	484.8
19	5 55 54.17	142.49	25 30 14.2	150.4	19	7 44 22.80	127.54	21 07 14.5	490.4
20	5 58 16.66	142.26	25 27 43.8	158.8	20	7 46 30.34	127.20	20 59 04.1	495.9
21	6 00 38.92	142.02	25 25 05.0	167.2	21	7 48 37.54	126.86	20 50 48.2	501.4
22	6 03 00.94	141.76	25 22 17.8	175.6	22	7 50 44.40	126.52	20 42 26.8	506.7
23	6 05 22.70	141.52	+25 19 22.2	-183.9	23	7 52 50.92	126.18	+20 34 00.1	-512.1
Monday, June 3					Wednesday, June 5				
0	6 07 44.22	141.26	+25 16 18.3	-192.1	0	7 54 57.10	125.85	+20 25 28.0	-517.3
1	6 10 05.48	141.00	25 13 06.2	200.4	1	7 57 02.95	125.50	20 16 50.7	522.5
2	6 12 26.48	140.73	25 09 45.8	208.5	2	7 59 08.45	125.17	20 08 08.2	527.7
3	6 14 47.21	140.46	25 06 17.3	216.6	3	8 01 13.62	124.84	19 59 20.5	532.7
4	6 17 07.67	140.18	25 02 40.7	224.6	4	8 03 18.46	124.51	19 50 27.8	537.7
5	6 19 27.85	139.91	24 58 56.1	232.6	5	8 05 22.97	124.18	19 41 30.1	542.6
6	6 21 47.76	139.63	24 55 03.5	240.6	6	8 07 27.15	123.84	19 32 27.5	547.6
7	6 24 07.39	139.34	24 51 02.9	248.4	7	8 09 30.99	123.52	19 23 19.9	552.3
8	6 26 26.73	139.05	24 46 54.5	256.3	8	8 11 34.51	123.19	19 14 07.6	557.1
9	6 28 45.78	138.75	24 42 38.2	264.0	9	8 13 37.70	122.87	19 04 50.5	561.8
10	6 31 04.53	138.46	24 38 14.2	271.7	10	8 15 40.57	122.54	18 55 28.7	566.4
11	6 33 22.99	138.16	24 33 42.5	279.4	11	8 17 43.11	122.22	18 46 02.3	570.9
12	6 35 41.15	137.86	24 29 03.1	286.9	12	8 19 45.33	121.90	18 36 31.4	575.5
13	6 37 59.01	137.55	24 24 16.2	294.5	13	8 21 47.23	121.59	18 26 55.9	579.8
14	6 40 16.56	137.23	24 19 21.7	302.0	14	8 23 48.82	121.27	18 17 16.1	584.3
15	6 42 33.79	136.93	24 14 19.7	309.3	15	8 25 50.09	120.96	18 07 31.8	588.6
16	6 44 50.72	136.61	24 09 10.4	316.7	16	8 27 51.05	120.65	17 57 43.2	592.9
17	6 47 07.33	136.30	24 03 53.7	323.9	17	8 29 51.70	120.34	17 47 50.3	597.0
18	6 49 23.63	135.97	23 58 29.8	331.2	18	8 31 52.04	120.04	17 37 53.3	601.2
19	6 51 39.60	135.65	23 52 58.6	338.3	19	8 33 52.08	119.74	17 27 52.1	605.3
20	6 53 55.25	135.33	23 47 20.3	345.4	20	8 35 51.82	119.43	17 17 46.8	609.3
21	6 56 10.58	135.00	23 41 34.9	352.4	21	8 37 51.25	119.14	17 07 37.5	613.3
22	6 58 25.58	134.68	23 35 42.5	359.4	22	8 39 50.39	118.84	16 57 24.2	617.2
23	7 00 40.26	134.34	23 29 43.1	366.3	23	8 41 49.23	118.54	16 47 07.0	621.1
24	7 02 54.60		+23 23 36.8		24	8 43 47.77		+16 36 45.9	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Thursday, June 6			Saturday, June 8		
0	^h 8 ^m 43 ^s 47.77 [°] 118.26	+16 36 45.9 -624.8	0	^h 10 ^m 13 ^s 57.45 [°] 108.34	+ 7 21 19.8 -748.3
1	8 45 46.03 [°] 117-97	16 26 21.1 628.6	1	10 15 45.79 [°] 108.23	7 08 51.5 749.8
2	8 47 44.00 [°] 117-69	16 15 52.5 632.3	2	10 17 34.02 [°] 108.12	6 56 21.7 751.2
3	8 49 41.69 [°] 117-40	16 05 20.2 635.9	3	10 19 22.14 [°] 108.02	6 43 50.5 752.6
4	8 51 39.09 [°] 117-13	15 54 44.3 639.5	4	10 21 10.16 [°] 107.92	6 31 17.9 754.0
5	8 53 36.22 [°] 116-85	15 44 04.8 643.1	5	10 22 58.08 [°] 107.82	6 18 43.9 755.3
6	8 55 33.07 [°] 116-58	15 33 21.7 646.5	6	10 24 45.90 [°] 107.73	6 06 08.6 756.7
7	8 57 29.65 [°] 116-31	15 22 35.2 649.9	7	10 26 33.63 [°] 107.64	5 53 31.9 757.8
8	8 59 25.96 [°] 116.04	15 11 45.3 653.2	8	10 28 21.27 [°] 107.56	5 40 54.1 759.1
9	9 01 22.00 [°] 115.78	15 00 52.1 656.6	9	10 30 08.83 [°] 107.48	5 28 15.0 760.3
10	9 03 17.78 [°] 115.53	14 49 55.5 659.8	10	10 31 56.31 [°] 107.41	5 15 34.7 761.4
11	9 05 13.31 [°] 115.26	14 38 55.7 663.0	11	10 33 43.72 [°] 107.33	5 02 53.3 762.5
12	9 07 08.57 [°] 115.01	14 27 52.7 666.2	12	10 35 31.05 [°] 107.27	4 50 10.8 763.6
13	9 09 03.58 [°] 114.77	14 16 46.5 669.2	13	10 37 18.32 [°] 107.21	4 37 27.2 764.5
14	9 10 58.35 [°] 114.51	14 05 37.3 672.3	14	10 39 05.53 [°] 107.14	4 24 42.7 765.6
15	9 12 52.86 [°] 114.28	13 54 25.0 675.3	15	10 40 52.67 [°] 107.10	4 11 57.1 766.5
16	9 14 47.14 [°] 114.03	13 43 09.7 678.3	16	10 42 39.77 [°] 107.04	3 59 10.6 767.5
17	9 16 41.17 [°] 113.80	13 31 51.4 681.1	17	10 44 26.81 [°] 107.00	3 46 23.1 768.3
18	9 18 34.97 [°] 113.56	13 20 30.3 684.0	18	10 46 13.81 [°] 106.96	3 33 34.8 769.1
19	9 20 28.53 [°] 113.34	13 09 06.3 686.8	19	10 48 00.77 [°] 106.92	3 20 45.7 770.0
20	9 22 21.87 [°] 113.11	12 57 39.5 689.6	20	10 49 47.69 [°] 106.89	3 07 55.7 770.7
21	9 24 14.98 [°] 112.89	12 46 09.9 692.3	21	10 51 34.58 [°] 106.86	2 55 05.0 771.4
22	9 26 07.87 [°] 112.67	12 34 37.6 694.9	22	10 53 21.44 [°] 106.84	2 42 13.6 772.1
23	9 28 00.54 [°] 112.45	+12 23 02.7 -697.5	23	10 55 08.28 [°] 106.82	+ 2 29 21.5 -772.8
Friday, June 7			Sunday, June 9		
0	9 29 52.99 [°] 112.24	+12 11 25.2 -700.0	0	10 56 55.10 [°] 106.80	+ 2 16 28.7 -773.4
1	9 31 45.23 [°] 112.04	11 59 45.2 702.6	1	10 58 41.90 [°] 106.80	2 03 35.3 773.9
2	9 33 37.27 [°] 111.84	11 48 02.6 705.1	2	11 00 28.70 [°] 106.78	1 50 41.4 774.5
3	9 35 29.11 [°] 111.63	11 36 17.5 707.4	3	11 02 15.48 [°] 106.78	1 37 46.9 775.1
4	9 37 20.74 [°] 111.44	11 24 30.1 709.9	4	11 04 02.26 [°] 106.79	1 24 51.8 775.4
5	9 39 12.18 [°] 111.24	11 12 40.2 712.2	5	11 05 49.05 [°] 106.79	1 11 56.4 775.9
6	9 41 03.42 [°] 111.06	11 00 48.0 714.5	6	11 07 35.84 [°] 106.80	0 59 00.5 776.3
7	9 42 54.48 [°] 110.87	10 48 53.5 716.7	7	11 09 22.64 [°] 106.82	0 46 04.2 776.7
8	9 44 45.35 [°] 110.70	10 36 56.8 718.9	8	11 11 09.46 [°] 106.83	0 33 07.5 776.9
9	9 46 36.05 [°] 110.51	10 24 57.9 721.1	9	11 12 56.29 [°] 106.86	0 20 10.6 777.3
10	9 48 26.56 [°] 110.35	10 12 56.8 723.2	10	11 14 43.15 [°] 106.89	+ 0 07 13.3 777.5
11	9 50 16.91 [°] 110.17	10 00 53.6 725.2	11	11 16 30.04 [°] 106.92	- 0 05 44.2 777.7
12	9 52 07.08 [°] 110.01	9 48 48.4 727.3	12	11 18 16.96 [°] 106.96	0 18 41.9 777.9
13	9 53 57.09 [°] 109.85	9 36 41.1 729.2	13	11 20 03.92 [°] 106.99	0 31 39.8 778.0
14	9 55 46.94 [°] 109.69	9 24 31.9 731.2	14	11 21 50.91 [°] 107.05	0 44 37.8 778.1
15	9 57 36.63 [°] 109.54	9 12 20.7 733.1	15	11 23 37.96 [°] 107.09	0 57 35.9 778.1
16	9 59 26.17 [°] 109.39	9 00 07.6 734.9	16	11 25 25.05 [°] 107.15	1 10 34.0 778.2
17	10 01 15.56 [°] 109.24	8 47 52.7 736.7	17	11 27 12.20 [°] 107.21	1 23 32.2 778.1
18	10 03 04.80 [°] 109.10	8 35 36.0 738.5	18	11 28 59.41 [°] 107.27	1 36 30.3 778.1
19	10 04 53.90 [°] 108.97	8 23 17.5 740.3	19	11 30 46.68 [°] 107.34	1 49 28.4 778.0
20	10 06 42.87 [°] 108.84	8 10 57.2 741.9	20	11 32 34.02 [°] 107.41	2 02 26.4 777.8
21	10 08 31.71 [°] 108.70	7 58 35.3 743.6	21	11 34 21.43 [°] 107.48	2 15 24.2 777.6
22	10 10 20.41 [°] 108.58	7 46 11.7 745.1	22	11 36 08.91 [°] 107.57	2 28 21.8 777.5
23	10 12 08.99 [°] 108.46	7 33 46.6 746.8	23	11 37 56.48 [°] 107.65	2 41 19.3 777.2
24	10 13 57.45	+ 7 21 19.8	24	11 39 44.13	- 2 54 16.5

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Monday, June 10			Wednesday, June 12		
0	11 39 44.13 107.74	2 54 16.5 -776.9	0	13 08 57.63 117.17	-12 57 01.4 -710.2
1	11 41 31.87 107.84	3 07 13.4 776.5	1	13 10 54.80 117.47	13 08 51.6 707.5
2	11 43 19.71 107.94	3 20 09.9 776.2	2	13 12 52.27 117.78	13 20 39.1 704.8
3	11 45 07.65 108.03	3 33 06.1 775.8	3	13 14 50.05 118.08	13 32 23.9 702.0
4	11 46 55.68 108.15	3 46 01.9 775.3	4	13 16 48.13 118.39	13 44 05.9 699.1
5	11 48 43.83 108.26	3 58 57.2 774.8	5	13 18 46.52 118.71	13 55 45.0 696.3
6	11 50 32.09 108.37	4 11 52.0 774.3	6	13 20 45.23 119.02	14 07 21.3 693.2
7	11 52 20.46 108.49	4 24 46.3 773.7	7	13 22 44.25 119.35	14 18 54.5 690.3
8	11 54 08.95 108.62	4 37 40.0 773.1	8	13 24 43.60 119.68	14 30 24.8 687.1
9	11 55 57.57 108.75	4 50 33.1 772.4	9	13 26 43.28 120.00	14 41 51.9 683.9
10	11 57 46.32 108.88	5 03 25.5 771.8	10	13 28 43.28 120.34	14 53 15.8 680.8
11	11 59 35.20 109.02	5 16 17.3 771.0	11	13 30 43.62 120.67	15 04 36.6 677.4
12	12 01 24.22 109.16	5 29 08.3 770.2	12	13 32 44.29 121.01	15 15 54.0 674.1
13	12 03 13.38 109.31	5 41 58.5 769.4	13	13 34 45.30 121.36	15 27 08.1 670.6
14	12 05 02.69 109.46	5 54 47.9 768.5	14	13 36 46.66 121.71	15 38 18.7 667.2
15	12 06 52.15 109.61	6 07 36.4 767.6	15	13 38 48.37 122.05	15 49 25.9 663.6
16	12 08 41.76 109.78	6 20 24.0 766.7	16	13 40 50.42 122.41	16 00 29.5 660.0
17	12 10 31.54 109.94	6 33 10.7 765.6	17	13 42 52.83 122.76	16 11 29.5 656.2
18	12 12 21.48 110.11	6 45 56.3 764.6	18	13 44 55.59 123.12	16 22 25.7 652.5
19	12 14 11.59 110.28	6 58 40.9 763.5	19	13 46 58.71 123.49	16 33 18.2 648.6
20	12 16 01.87 110.46	7 11 24.4 762.4	20	13 49 02.20 123.85	16 44 06.8 644.7
21	12 17 52.33 110.64	7 24 06.8 761.1	21	13 51 06.05 124.22	16 54 51.5 640.7
22	12 19 42.97 110.82	7 36 47.9 760.0	22	13 53 10.27 124.59	17 05 32.2 636.7
23	12 21 33.79 111.02	7 49 27.9 -758.6	23	13 55 14.86 124.97	17 16 08.9 -632.5
Tuesday, June 11			Thursday, June 13		
0	12 23 24.81 111.21	8 02 06.5 -757.3	0	13 57 19.83 125.34	-17 26 41.4 -628.3
1	12 25 16.02 111.42	8 14 43.8 756.0	1	13 59 25.17 125.73	17 37 09.7 624.1
2	12 27 07.44 111.61	8 27 19.8 754.5	2	14 01 30.90 126.10	17 47 33.8 619.6
3	12 28 59.05 111.83	8 39 54.3 753.1	3	14 03 37.00 126.49	17 57 53.4 615.3
4	12 30 50.88 112.03	8 52 27.4 751.5	4	14 05 43.49 126.88	18 08 08.7 610.7
5	12 32 42.91 112.25	9 04 58.9 750.0	5	14 07 50.37 127.27	18 18 19.4 606.2
6	12 34 35.16 112.48	9 17 28.9 748.3	6	14 09 57.64 127.66	18 28 25.6 601.5
7	12 36 27.64 112.70	9 29 57.2 746.7	7	14 12 05.30 128.05	18 38 27.1 596.7
8	12 38 20.34 112.93	9 42 23.9 745.0	8	14 14 13.35 128.45	18 48 23.8 592.0
9	12 40 13.27 113.16	9 54 48.9 743.2	9	14 16 21.80 128.85	18 58 15.8 587.0
10	12 42 06.43 113.41	10 07 12.1 741.4	10	14 18 30.65 129.24	19 08 02.8 582.0
11	12 43 59.84 113.64	10 19 33.5 739.5	11	14 20 39.89 129.65	19 17 44.8 577.0
12	12 45 53.48 113.89	10 31 53.0 737.6	12	14 22 49.54 130.05	19 27 21.8 571.9
13	12 47 47.37 114.14	10 44 10.6 735.6	13	14 24 59.59 130.45	19 36 53.7 566.6
14	12 49 41.51 114.40	10 56 26.2 733.6	14	14 27 10.04 130.86	19 46 20.3 561.4
15	12 51 35.91 114.65	11 08 39.8 731.5	15	14 29 20.90 131.27	19 55 41.7 556.0
16	12 53 30.56 114.92	11 20 51.3 729.4	16	14 31 32.17 131.68	20 04 57.7 550.5
17	12 55 25.48 115.19	11 33 00.7 727.1	17	14 33 43.85 132.09	20 14 08.2 545.0
18	12 57 20.67 115.46	11 45 07.8 724.9	18	14 35 55.94 132.50	20 23 13.2 539.4
19	12 59 16.13 115.73	11 57 12.7 722.6	19	14 38 08.44 132.90	20 32 12.6 533.6
20	13 01 11.86 116.01	12 09 15.3 720.2	20	14 40 21.34 133.32	20 41 06.2 527.9
21	13 03 07.87 116.30	12 21 15.5 717.8	21	14 42 34.66 133.74	20 49 54.1 521.9
22	13 05 04.17 116.58	12 33 13.3 715.3	22	14 44 48.40 134.15	20 58 36.0 516.1
23	13 07 00.75 116.88	12 45 08.6 -712.8	23	14 47 02.55 134.56	21 07 12.1 -510.0
24	13 08 57.63	-12 57 01.4	24	14 49 17.11	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Friday, June 14							Sunday, June 16						
0	14	49	17.11	134.97	-21	15 42.1	0	16	44	31.58	152.05	-25	38 31.4
1	14	51	32.08	135.39	21	24 06.0	1	16	47	03.63	152.28	25	40 27.3
2	14	53	47.47	135.80	21	32 23.7	2	16	49	35.91	152.51	25	42 13.4
3	14	56	03.27	136.22	21	40 35.1	3	16	52	08.42	152.72	25	43 49.7
4	14	58	19.49	136.63	21	48 40.1	4	16	54	41.14	152.93	25	45 16.1
5	15	00	36.12	137.05	21	56 38.7	5	16	57	14.07	153.13	25	46 32.6
6	15	02	53.17	137.45	22	04 30.7	6	16	59	47.20	153.32	25	47 39.2
7	15	05	10.62	137.87	22	12 16.2	7	17	02	20.52	153.51	25	48 35.8
8	15	07	28.49	138.28	22	19 54.9	8	17	04	54.03	153.68	25	49 22.4
9	15	09	46.77	138.68	22	27 26.8	9	17	07	27.71	153.85	25	49 58.9
10	15	12	05.45	139.10	22	34 51.8	10	17	10	01.56	154.01	25	50 25.3
11	15	14	24.55	139.50	22	42 09.9	11	17	12	35.57	154.16	25	50 41.6
12	15	16	44.05	139.91	22	49 20.9	12	17	15	09.73	154.30	25	50 47.7
13	15	19	03.96	140.31	22	56 24.8	13	17	17	44.03	154.44	25	50 43.6
14	15	21	24.27	140.71	23	03 21.5	14	17	20	18.47	154.57	25	50 29.3
15	15	23	44.98	141.11	23	10 10.9	15	17	22	53.04	154.67	25	50 04.8
16	15	26	06.09	141.51	23	16 52.9	16	17	25	27.71	154.79	25	49 30.0
17	15	28	27.60	141.91	23	23 27.4	17	17	28	02.50	154.89	25	48 44.8
18	15	30	49.51	142.31	23	29 54.4	18	17	30	37.39	154.97	25	47 49.4
19	15	33	11.80	142.69	23	36 13.8	19	17	33	12.36	155.06	25	46 43.7
20	15	35	34.49	143.07	23	42 25.4	20	17	35	47.42	155.13	25	45 27.6
21	15	37	57.56	143.45	23	48 29.3	21	17	38	22.55	155.19	25	44 01.2
22	15	40	21.01	143.84	23	54 25.3	22	17	40	57.74	155.25	25	42 24.5
23	15	42	44.85	144.21	-24	00 13.4	23	17	43	32.99	155.29	-25	40 37.3
Saturday, June 15							Monday, June 17						
0	15	45	09.06	144.59	-24	05 53.4	0	17	46	08.28	155.33	-25	38 39.8
1	15	47	33.65	144.96	24	11 25.3	1	17	48	43.61	155.36	25	36 31.9
2	15	49	58.61	145.32	24	16 49.1	2	17	51	18.97	155.38	25	34 13.6
3	15	52	23.93	145.69	24	22 04.5	3	17	53	54.35	155.38	25	31 45.0
4	15	54	49.62	146.04	24	27 11.6	4	17	56	29.73	155.39	25	29 05.9
5	15	57	15.66	146.40	24	32 10.3	5	17	59	05.12	155.39	25	26 16.5
6	15	59	42.06	146.75	24	37 00.5	6	18	01	40.51	155.36	25	23 16.7
7	16	02	08.81	147.09	24	41 42.1	7	18	04	15.87	155.35	25	20 06.6
8	16	04	35.90	147.42	24	46 15.1	8	18	06	51.22	155.31	25	16 46.2
9	16	07	03.32	147.76	24	50 39.4	9	18	09	26.53	155.26	25	13 15.4
10	16	09	31.08	148.09	24	54 54.9	10	18	12	01.79	155.22	25	09 34.3
11	16	11	59.17	148.42	24	59 01.5	11	18	14	37.01	155.16	25	05 43.0
12	16	14	27.59	148.73	25	02 59.2	12	18	17	12.17	155.10	25	01 41.3
13	16	16	56.32	149.05	25	06 47.9	13	18	19	47.27	155.01	24	57 29.4
14	16	19	25.37	149.35	25	10 27.5	14	18	22	22.28	154.94	24	53 07.3
15	16	21	54.72	149.65	25	13 58.0	15	18	24	57.22	154.84	24	48 35.0
16	16	24	24.37	149.94	25	17 19.3	16	18	27	32.06	154.75	24	43 52.5
17	16	26	54.31	150.23	25	20 31.3	17	18	30	06.81	154.64	24	38 59.9
18	16	29	24.54	150.51	25	23 34.0	18	18	32	41.45	154.52	24	33 57.2
19	16	31	55.05	150.79	25	26 27.4	19	18	35	15.97	154.40	24	28 44.4
20	16	34	25.84	151.05	25	29 11.3	20	18	37	50.37	154.28	24	23 21.7
21	16	36	56.89	151.31	25	31 45.7	21	18	40	24.65	154.13	24	17 48.9
22	16	39	28.20	151.57	25	34 10.6	22	18	42	58.78	154.00	24	12 06.2
23	16	41	59.77	151.81	25	36 25.8	23	18	45	32.78	153.84	24	06 13.7
24	16	44	31.58		-25	38 31.4	24	18	48	06.62		-24	00 11.2

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Tuesday, June 18					Thursday, June 20				
0	18 ^h 48 ^m 06.62 ^s	153.68	-24° 00' 11.2"	+372.2	0	20 ^h 46 ^m 33.64 ^s	141.10	-16° 19' 04.1"	+756.6
1	18 50 40.30	153.52	23 53 59.0	382.0	1	20 48 54.74	140.80	16 06 27.5	762.4
2	18 53 13.82	153.34	23 47 37.0	391.7	2	20 51 15.54	140.51	15 53 45.1	768.1
3	18 55 47.16	153.16	23 41 05.3	401.4	3	20 53 36.05	140.20	15 40 57.0	773.7
4	18 58 20.32	152.99	23 34 23.9	410.9	4	20 55 56.25	139.92	15 28 03.3	779.2
5	19 00 53.31	152.79	23 27 33.0	420.5	5	20 58 16.17	139.62	15 15 04.1	784.5
6	19 03 26.10	152.59	23 20 32.5	429.9	6	21 00 35.79	139.33	15 01 59.6	789.9
7	19 05 58.69	152.39	23 13 22.6	439.4	7	21 02 55.12	139.05	14 48 49.7	795.1
8	19 08 31.08	152.19	23 06 03.2	448.6	8	21 05 14.17	138.75	14 35 34.6	800.2
9	19 11 03.27	151.97	22 58 34.6	458.0	9	21 07 32.92	138.47	14 22 14.4	805.1
10	19 13 35.24	151.75	22 50 56.6	467.2	10	21 09 51.39	138.19	14 08 49.3	810.1
11	19 16 06.99	151.52	22 43 09.4	476.3	11	21 12 09.58	137.91	13 55 19.2	814.9
12	19 18 38.51	151.29	22 35 13.1	485.4	12	21 14 27.49	137.63	13 41 44.3	819.6
13	19 21 09.80	151.06	22 27 07.7	494.5	13	21 16 45.12	137.35	13 28 04.7	824.2
14	19 23 40.86	150.82	22 18 53.2	503.3	14	21 19 02.47	137.08	13 14 20.5	828.7
15	19 26 11.68	150.58	22 10 29.9	512.3	15	21 21 19.55	136.81	13 00 31.8	833.0
16	19 28 42.26	150.32	22 01 57.6	521.0	16	21 23 36.36	136.54	12 46 38.8	837.4
17	19 31 12.58	150.08	21 53 16.6	529.8	17	21 25 52.90	136.28	12 32 41.4	841.6
18	19 33 42.66	149.82	21 44 26.8	538.4	18	21 28 09.18	136.01	12 18 39.8	845.6
19	19 36 12.48	149.56	21 35 28.4	546.9	19	21 30 25.19	135.76	12 04 34.2	849.7
20	19 38 42.04	149.29	21 26 21.5	555.4	20	21 32 40.95	135.50	11 50 24.5	853.6
21	19 41 11.33	149.03	21 17 06.1	563.8	21	21 34 56.45	135.24	11 36 10.9	857.3
22	19 43 40.36	148.75	21 07 42.3	572.1	22	21 37 11.69	134.99	11 21 53.6	861.1
23	19 46 09.11	148.48	-20 58 10.2	+580.4	23	21 39 26.68	134.75	-11 07 32.5	+864.7
Wednesday, June 19					Friday, June 21				
0	19 48 37.59	148.21	-20 48 29.8	+588.5	0	21 41 41.43	134.51	-10 53 07.8	+868.2
1	19 51 05.80	147.92	20 38 41.3	596.6	1	21 43 55.94	134.26	10 38 39.6	871.6
2	19 53 33.72	147.64	20 28 44.7	604.5	2	21 46 10.20	134.03	10 24 08.0	874.9
3	19 56 01.36	147.35	20 18 40.2	612.5	3	21 48 24.23	133.79	10 09 33.1	878.1
4	19 58 28.71	147.06	20 08 27.7	620.2	4	21 50 38.02	133.57	9 54 55.0	881.2
5	20 00 55.77	146.78	19 58 07.5	627.9	5	21 52 51.59	133.34	9 40 13.8	884.3
6	20 03 22.55	146.49	19 47 39.6	635.6	6	21 55 04.93	133.12	9 25 29.5	887.1
7	20 05 49.04	146.19	19 37 04.0	643.1	7	21 57 18.05	132.90	9 10 42.4	890.0
8	20 08 15.23	145.90	19 26 20.9	650.5	8	21 59 30.95	132.69	8 55 52.4	892.8
9	20 10 41.13	145.60	19 15 30.4	657.9	9	22 01 43.64	132.48	8 40 59.6	895.3
10	20 13 06.73	145.31	19 04 32.5	665.1	10	22 03 56.12	132.27	8 26 04.3	897.9
11	20 15 32.04	145.00	18 53 27.4	672.3	11	22 06 08.39	132.07	8 11 06.4	900.4
12	20 17 57.04	144.71	18 42 15.1	679.3	12	22 08 20.46	131.87	7 56 06.0	902.7
13	20 20 21.75	144.40	18 30 55.8	686.4	13	22 10 32.33	131.68	7 41 03.3	905.0
14	20 22 46.15	144.11	18 19 29.4	693.2	14	22 12 44.01	131.49	7 25 58.3	907.1
15	20 25 10.26	143.80	18 07 56.2	699.9	15	22 14 55.50	131.30	7 10 51.2	909.2
16	20 27 34.06	143.50	17 56 16.3	706.7	16	22 17 06.80	131.13	6 55 42.0	911.1
17	20 29 57.56	143.20	17 44 29.6	713.3	17	22 19 17.93	130.94	6 40 30.9	913.1
18	20 32 20.76	142.90	17 32 36.3	719.7	18	22 21 28.87	130.77	6 25 17.8	914.8
19	20 34 43.66	142.60	17 20 36.6	726.1	19	22 23 39.64	130.61	6 10 03.0	916.5
20	20 37 06.26	142.30	17 08 30.5	732.4	20	22 25 50.25	130.44	5 54 46.5	918.2
21	20 39 28.56	141.99	16 56 18.1	738.6	21	22 28 00.69	130.28	5 39 28.3	919.6
22	20 41 50.55	141.70	16 43 59.5	744.7	22	22 30 10.97	130.13	5 24 08.7	921.1
23	20 44 12.25	141.39	16 31 34.8	750.7	23	22 32 21.10	129.98	5 08 47.6	922.4
24	20 46 33.64		-16 19 04.1		24	22 34 31.08		-4 53 25.2	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Saturday, June 22					Monday, June 24				
0	22 34 31.08	129.83	- 4 53 25.2	+923.6	0	0 17 04.80	128.32	+ 7 22 15.2	+882.9
1	22 36 40.91	129.70	4 38 01.6	924.8	1	0 19 13.12	128.39	7 36 58.1	880.0
2	22 38 50.61	129.55	4 22 36.8	925.9	2	0 21 21.51	128.48	7 51 38.1	877.2
3	22 41 00.16	129.42	4 07 10.9	926.8	3	0 23 29.99	128.57	8 06 15.3	874.1
4	22 43 09.58	129.30	3 51 44.1	927.7	4	0 25 38.56	128.66	8 20 49.4	871.1
5	22 45 18.88	129.17	3 36 16.4	928.5	5	0 27 47.22	128.76	8 35 20.5	868.0
6	22 47 28.05	129.06	3 20 47.9	929.2	6	0 29 55.98	128.85	8 49 48.5	864.7
7	22 49 37.11	128.94	3 05 18.7	929.8	7	0 32 04.83	128.95	9 04 13.2	861.4
8	22 51 46.05	128.84	2 49 48.9	930.4	8	0 34 13.78	129.06	9 18 34.6	858.1
9	22 53 54.89	128.73	2 34 18.5	930.8	9	0 36 22.84	129.17	9 32 52.7	854.7
10	22 56 03.62	128.63	2 18 47.7	931.1	10	0 38 32.01	129.29	9 47 07.4	851.1
11	22 58 12.25	128.53	2 03 16.6	931.4	11	0 40 41.30	129.40	10 01 18.5	847.6
12	23 00 20.78	128.45	1 47 45.2	931.6	12	0 42 50.70	129.52	10 15 26.1	843.9
13	23 02 29.23	128.36	1 32 13.6	931.7	13	0 45 00.22	129.65	10 29 30.0	840.1
14	23 04 37.59	128.28	1 16 41.9	931.6	14	0 47 09.87	129.78	10 43 30.1	836.3
15	23 06 45.87	128.20	1 01 10.3	931.6	15	0 49 19.65	129.91	10 57 26.4	832.4
16	23 08 54.07	128.14	0 45 38.7	931.5	16	0 51 29.56	130.04	11 11 18.8	828.5
17	23 11 02.21	128.07	0 30 07.2	931.2	17	0 53 39.60	130.18	11 25 07.3	824.4
18	23 13 10.28	128.00	- 0 14 36.0	930.8	18	0 55 49.78	130.32	11 38 51.7	820.3
19	23 15 18.28	127.95	+ 0 00 54.8	930.5	19	0 58 00.10	130.47	11 52 32.0	816.1
20	23 17 26.23	127.90	0 16 25.3	930.0	20	1 00 10.57	130.62	12 06 08.1	811.8
21	23 19 34.13	127.85	0 31 55.3	929.3	21	1 02 21.19	130.76	12 19 39.9	807.5
22	23 21 41.98	127.81	0 47 24.6	928.7	22	1 04 31.95	130.92	12 33 07.4	803.0
23	23 23 49.79	127.77	+ 1 02 53.3	+928.0	23	1 06 42.87	131.08	+12 46 30.4	+798.6
Sunday, June 23					Tuesday, June 25				
0	23 25 57.56	127.74	+ 1 18 21.3	+927.1	0	1 08 53.95	131.24	+12 59 49.0	+794.0
1	23 28 05.30	127.71	1 33 48.4	926.2	1	1 11 05.19	131.39	13 13 03.0	789.4
2	23 30 13.01	127.68	1 49 14.6	925.2	2	1 13 16.58	131.57	13 26 12.4	784.7
3	23 32 20.69	127.67	2 04 39.8	924.1	3	1 15 28.15	131.73	13 39 17.1	779.8
4	23 34 28.36	127.65	2 20 03.9	923.0	4	1 17 39.88	131.90	13 52 16.9	775.0
5	23 36 36.01	127.65	2 35 26.9	921.7	5	1 19 51.78	132.08	14 05 11.9	770.1
6	23 38 43.66	127.64	2 50 48.6	920.4	6	1 22 03.86	132.25	14 18 02.0	765.1
7	23 40 51.30	127.64	3 06 09.0	918.9	7	1 24 16.11	132.43	14 30 47.1	760.0
8	23 42 58.94	127.64	3 21 27.9	917.5	8	1 26 28.54	132.61	14 43 27.1	754.9
9	23 45 06.58	127.65	3 36 45.4	916.0	9	1 28 41.15	132.79	14 56 02.0	749.6
10	23 47 14.23	127.67	3 52 01.4	914.3	10	1 30 53.94	132.97	15 08 31.6	744.3
11	23 49 21.90	127.68	4 07 15.7	912.5	11	1 33 06.91	133.16	15 20 55.9	739.0
12	23 51 29.58	127.71	4 22 28.2	910.8	12	1 35 20.07	133.35	15 33 14.9	733.6
13	23 53 37.29	127.73	4 37 39.0	908.8	13	1 37 33.42	133.53	15 45 28.5	728.0
14	23 55 45.02	127.76	4 52 47.8	906.9	14	1 39 46.95	133.73	15 57 36.5	722.5
15	23 57 52.78	127.81	5 07 54.7	904.9	15	1 42 00.68	133.93	16 09 39.0	716.8
16	0 00 00.59	127.84	5 22 59.6	902.7	16	1 44 14.61	134.11	16 21 35.8	711.2
17	0 02 08.43	127.88	5 38 02.3	900.5	17	1 46 28.72	134.31	16 33 27.0	705.3
18	0 04 16.31	127.93	5 53 02.8	898.3	18	1 48 43.03	134.51	16 45 12.3	699.5
19	0 06 24.24	127.99	6 08 01.1	895.8	19	1 50 57.54	134.71	16 56 51.8	693.5
20	0 08 32.23	128.05	6 22 56.9	893.5	20	1 53 12.25	134.90	17 08 25.3	687.6
21	0 10 40.28	128.10	6 37 50.4	890.9	21	1 55 27.15	135.11	17 19 52.9	681.5
22	0 12 48.38	128.18	6 52 41.3	888.3	22	1 57 42.26	135.30	17 31 14.4	675.3
23	0 14 56.56	128.24	7 07 29.6	+885.6	23	1 59 57.56	135.51	17 42 29.7	+669.2
24	0 17 04.80		+ 7 22 15.2		24	2 02 13.07		+17 53 38.9	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Wednesday, June 26							Friday, June 28						
0	^h 2 02	^m 13·07	^s 135·71	[°] +17 53	['] 38·9	["] +662·9	0	^h 3 54	^m 21·15	^s 143·92	[°] +24 27	['] 37·8	["] +294·7
1	2 04	28·78	135·91	18 04	41·8	656·6	1	3 56	45·07	144·00	24 32	32·5	285·9
2	2 06	44·69	136·12	18 15	38·4	650·2	2	3 59	09·07	144·09	24 37	18·4	277·2
3	2 09	00·81	136·32	18 26	28·6	643·7	3	4 01	33·16	144·18	24 41	55·6	268·4
4	2 11	17·13	136·53	18 37	12·3	637·2	4	4 03	57·34	144·25	24 46	24·0	259·6
5	2 13	33·66	136·73	18 47	49·5	630·5	5	4 06	21·59	144·31	24 50	43·6	250·7
6	2 15	50·39	136·93	18 58	20·0	623·9	6	4 08	45·90	144·39	24 54	54·3	241·9
7	2 18	07·32	137·14	19 08	43·9	617·2	7	4 11	10·29	144·44	24 58	56·2	233·0
8	2 20	24·46	137·34	19 19	01·1	610·5	8	4 13	34·73	144·49	25 02	49·2	224·2
9	2 22	41·80	137·54	19 29	11·6	603·5	9	4 15	59·22	144·55	25 06	33·4	215·2
10	2 24	59·34	137·75	19 39	15·1	596·6	10	4 18	23·77	144·58	25 10	08·6	206·3
11	2 27	17·09	137·95	19 49	11·7	589·7	11	4 20	48·35	144·62	25 13	34·9	197·3
12	2 29	35·04	138·15	19 59	01·4	582·7	12	4 23	12·97	144·65	25 16	52·2	188·4
13	2 31	53·19	138·36	20 08	44·1	575·6	13	4 25	37·62	144·68	25 20	00·6	179·5
14	2 34	11·55	138·56	20 18	19·7	568·4	14	4 28	02·30	144·69	25 23	00·1	170·4
15	2 36	30·11	138·75	20 27	48·1	561·1	15	4 30	26·99	144·71	25 25	50·5	161·5
16	2 38	48·86	138·95	20 37	09·2	553·9	16	4 32	51·70	144·71	25 28	32·0	152·5
17	2 41	07·81	139·15	20 46	23·1	546·5	17	4 35	16·41	144·72	25 31	04·5	143·6
18	2 43	26·96	139·34	20 55	29·6	539·2	18	4 37	41·13	144·70	25 33	28·1	134·5
19	2 45	46·30	139·54	21 04	28·8	531·7	19	4 40	05·83	144·70	25 35	42·6	125·5
20	2 48	05·84	139·73	21 13	20·5	524·2	20	4 42	30·53	144·68	25 37	48·1	116·6
21	2 50	25·57	139·91	21 22	04·7	516·7	21	4 44	55·21	144·66	25 39	44·7	107·6
22	2 52	45·48	140·11	21 30	41·4	509·0	22	4 47	19·87	144·62	25 41	32·3	98·5
23	2 55	05·59	140·29	+21 39	10·4	+501·3	23	4 49	44·49	144·59	+25 43	10·8	+89·6
Thursday, June 27							Saturday, June 29						
0	2 57	25·88	140·48	+21 47	31·7	+493·7	0	4 52	09·08	144·55	+25 44	40·4	+80·6
1	2 59	46·36	140·66	21 55	45·4	485·8	1	4 54	33·63	144·50	25 46	01·0	71·6
2	3 02	07·02	140·83	22 03	51·2	478·0	2	4 56	58·13	144·44	25 47	12·6	62·6
3	3 04	27·85	141·02	22 11	49·2	470·2	3	4 59	22·57	144·38	25 48	15·2	53·7
4	3 06	48·87	141·18	22 19	39·4	462·2	4	5 01	46·95	144·32	25 49	08·9	44·7
5	3 09	10·05	141·36	22 27	21·6	454·2	5	5 04	11·27	144·24	25 49	53·6	35·8
6	3 11	31·41	141·52	22 34	55·8	446·2	6	5 06	35·51	144·16	25 50	29·4	26·8
7	3 13	52·93	141·69	22 42	22·0	438·1	7	5 08	59·67	144·07	25 50	56·2	18·0
8	3 16	14·62	141·85	22 49	40·1	430·0	8	5 11	23·74	143·99	25 51	14·2	9·0
9	3 18	36·47	142·00	22 56	50·1	421·9	9	5 13	47·73	143·88	25 51	23·2	+0·2
10	3 20	58·47	142·17	23 03	52·0	413·6	10	5 16	11·61	143·79	25 51	23·4	-8·7
11	3 23	20·64	142·32	23 10	45·6	405·4	11	5 18	35·40	143·67	25 51	14·7	17·6
12	3 25	42·96	142·47	23 17	31·0	397·1	12	5 20	59·07	143·56	25 50	57·1	26·3
13	3 28	05·43	142·60	23 24	08·1	388·8	13	5 23	22·63	143·43	25 50	30·8	35·2
14	3 30	28·03	142·75	23 30	36·9	380·4	14	5 25	46·06	143·30	25 49	55·6	43·9
15	3 32	50·78	142·89	23 36	57·3	371·9	15	5 28	09·36	143·17	25 49	11·7	52·7
16	3 35	13·67	143·02	23 43	09·2	363·5	16	5 30	32·53	143·04	25 48	19·0	61·4
17	3 37	36·69	143·15	23 49	12·7	355·1	17	5 32	55·57	142·88	25 47	17·6	70·1
18	3 39	59·84	143·27	23 55	07·8	346·5	18	5 35	18·45	142·73	25 46	07·5	78·8
19	3 42	23·11	143·38	24 00	54·3	337·9	19	5 37	41·18	142·58	25 44	48·7	87·3
20	3 44	46·49	143·51	24 06	32·2	329·4	20	5 40	03·76	142·41	25 43	21·4	96·0
21	3 47	10·00	143·61	24 12	01·6	320·7	21	5 42	26·17	142·25	25 41	45·4	104·6
22	3 49	33·61	143·72	24 17	22·3	312·1	22	5 44	48·42	142·07	25 40	00·8	113·1
23	3 51	57·33	143·82	24 22	34·4	+303·4	23	5 47	10·49	141·89	25 38	07·7	-121·6
24	3 54	21·15		+24 27	37·8		24	5 49	32·38		+25 36	06·1	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Sunday, June 30					Tuesday, July 2				
0	5 49 32.38	141.71	+25 36 06.1	-130.0	0	7 38 08.60	128.44	+21 27 38.5	-476.7
1	5 51 54.09	141.51	25 33 56.1	138.5	1	7 40 17.04	128.11	21 19 41.8	482.4
2	5 54 15.60	141.33	25 31 37.6	146.9	2	7 42 25.15	127.80	21 11 39.4	488.1
3	5 56 36.93	141.12	25 29 10.7	155.2	3	7 44 32.95	127.47	21 03 31.3	493.7
4	5 58 58.05	140.91	25 26 35.5	163.6	4	7 46 40.42	127.14	20 55 17.6	499.3
5	6 01 18.96	140.71	25 23 51.9	171.8	5	7 48 47.56	126.83	20 46 58.3	504.8
6	6 03 39.67	140.48	25 21 00.1	180.0	6	7 50 54.39	126.50	20 38 33.5	510.2
7	6 06 00.15	140.27	25 18 00.1	188.2	7	7 53 00.89	126.18	20 30 03.3	515.6
8	6 08 20.42	140.05	25 14 51.9	196.3	8	7 55 07.07	125.86	20 21 27.7	520.9
9	6 10 40.47	139.81	25 11 35.6	204.4	9	7 57 12.93	125.54	20 12 46.8	526.1
10	6 13 00.28	139.58	25 08 11.2	212.4	10	7 59 18.47	125.22	20 04 00.7	531.3
11	6 15 19.86	139.34	25 04 38.8	220.5	11	8 01 23.69	124.90	19 55 09.4	536.4
12	6 17 39.20	139.10	25 00 58.3	228.4	12	8 03 28.59	124.58	19 46 13.0	541.4
13	6 19 58.30	138.85	24 57 09.9	236.3	13	8 05 33.17	124.26	19 37 11.6	546.5
14	6 22 17.15	138.60	24 53 13.6	244.2	14	8 07 37.43	123.95	19 28 05.1	551.3
15	6 24 35.75	138.35	24 49 09.4	251.9	15	8 09 41.38	123.63	19 18 53.8	556.2
16	6 26 54.10	138.08	24 44 57.5	259.7	16	8 11 45.01	123.30	19 09 37.6	561.0
17	6 29 12.18	137.82	24 40 37.8	267.3	17	8 13 48.33	123.00	19 00 16.6	565.7
18	6 31 30.00	137.56	24 36 10.5	275.0	18	8 15 51.33	122.69	18 50 50.9	570.4
19	6 33 47.56	137.29	24 31 35.5	282.6	19	8 17 54.02	122.39	18 41 20.5	575.0
20	6 36 04.85	137.01	24 26 52.9	290.1	20	8 19 56.41	122.07	18 31 45.5	579.6
21	6 38 21.86	136.74	24 22 02.8	297.6	21	8 21 58.48	121.77	18 22 05.9	584.0
22	6 40 38.60	136.46	24 17 05.2	305.0	22	8 24 00.25	121.46	18 12 21.9	588.4
23	6 42 55.06	136.17	+24 12 00.2	-312.4	23	8 26 01.71	121.16	+18 02 33.5	-592.8
Monday, July 1					Wednesday, July 3				
0	6 45 11.23	135.89	+24 06 47.8	-319.7	0	8 28 02.87	120.86	+17 52 40.7	-597.1
1	6 47 27.12	135.60	24 01 28.1	326.9	1	8 30 03.73	120.56	17 42 43.6	601.3
2	6 49 42.72	135.31	23 56 01.2	334.0	2	8 32 04.29	120.26	17 32 42.3	605.5
3	6 51 58.03	135.01	23 50 27.2	341.3	3	8 34 04.55	119.96	17 22 36.8	609.6
4	6 54 13.04	134.72	23 44 45.9	348.3	4	8 36 04.51	119.67	17 12 27.2	613.7
5	6 56 27.76	134.42	23 38 57.6	355.3	5	8 38 04.18	119.38	17 02 13.5	617.6
6	6 58 42.18	134.12	23 33 02.3	362.2	6	8 40 03.56	119.09	16 51 55.9	621.6
7	7 00 56.30	133.82	23 27 00.1	369.2	7	8 42 02.65	118.80	16 41 34.3	625.5
8	7 03 10.12	133.51	23 20 50.9	375.9	8	8 44 01.45	118.51	16 31 08.8	629.3
9	7 05 23.63	133.20	23 14 35.0	382.8	9	8 45 59.96	118.24	16 20 39.5	633.0
10	7 07 36.83	132.90	23 08 12.2	389.4	10	8 47 58.20	117.95	16 10 06.5	636.8
11	7 09 49.73	132.58	23 01 42.8	396.1	11	8 49 56.15	117.68	15 59 29.7	640.4
12	7 12 02.31	132.27	22 55 06.7	402.7	12	8 51 53.83	117.40	15 48 49.3	644.0
13	7 14 14.58	131.96	22 48 24.0	409.1	13	8 53 51.23	117.13	15 38 05.3	647.5
14	7 16 26.54	131.64	22 41 34.9	415.7	14	8 55 48.36	116.86	15 27 17.8	650.9
15	7 18 38.18	131.32	22 34 39.2	422.0	15	8 57 45.22	116.59	15 16 26.9	654.4
16	7 20 49.50	131.01	22 27 37.2	428.4	16	8 59 41.81	116.33	15 05 32.5	657.8
17	7 23 00.51	130.69	22 20 28.8	434.6	17	9 01 38.14	116.06	14 54 34.7	661.0
18	7 25 11.20	130.37	22 13 14.2	440.8	18	9 03 34.20	115.81	14 43 33.7	664.3
19	7 27 21.57	130.05	22 05 53.4	447.0	19	9 05 30.01	115.55	14 32 29.4	667.6
20	7 29 31.62	129.73	21 58 26.4	453.0	20	9 07 25.56	115.30	14 21 21.8	670.6
21	7 31 41.35	129.40	21 50 53.4	459.0	21	9 09 20.86	115.04	14 10 11.2	673.7
22	7 33 50.75	129.09	21 43 14.4	465.0	22	9 11 15.90	114.80	13 58 57.5	676.8
23	7 35 59.84	128.76	21 35 29.4	-470.9	23	9 13 10.70	114.56	13 47 40.7	-679.7
24	7 38 08.60		+21 27 38.5		24	9 15 05.26		+13 36 21.0	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Thursday, July 4							Saturday, July 6						
0	^h 9 ^m 15 ^s 05.26	[°] 114.31	+ [°] 13 ['] 36 ["] 21.0	-682.6	1	^h 10 ^m 43 ^s 03.50	[°] 106.88	+ [°] 3 ['] 50 ["] 14.9	-767.1				
1	9 16 59.57	114.08	13 24 58.4	685.5	2	10 44 50.38	106.82	3 37 27.8	767.9				
2	9 18 53.65	113.84	13 13 32.9	688.4	3	10 46 37.20	106.76	3 24 39.9	768.5				
3	9 20 47.49	113.61	13 02 04.5	691.1	4	10 48 23.96	106.71	3 11 51.4	769.1				
4	9 22 41.10	113.38	12 50 33.4	693.8	5	10 50 10.67	106.66	2 59 02.3	769.8				
5	9 24 34.48	113.16	12 38 59.6	696.5	6	10 51 57.33	106.62	2 46 12.5	770.3				
6	9 26 27.64	112.93	12 27 23.1	699.1	7	10 53 43.95	106.58	2 33 22.2	770.8				
7	9 28 20.57	112.72	12 15 44.0	701.7	8	10 55 30.53	106.54	2 20 31.4	771.3				
8	9 30 13.29	112.50	12 04 02.3	704.2	9	10 57 17.07	106.51	2 07 40.1	771.8				
9	9 32 05.79	112.29	11 52 18.1	706.6	10	10 59 03.58	106.48	1 54 48.3	772.1				
10	9 33 58.08	112.08	11 40 31.5	709.1	11	11 00 50.06	106.45	1 41 56.2	772.5				
11	9 35 50.16	111.87	11 28 42.4	711.4	12	11 02 36.51	106.44	1 29 03.7	772.9				
12	9 37 42.03	111.67	11 16 51.0	713.7	13	11 04 22.95	106.42	1 16 10.8	773.2				
13	9 39 33.70	111.47	11 04 57.3	716.1	14	11 06 09.37	106.41	1 03 17.6	773.4				
14	9 41 25.17	111.28	10 53 01.2	718.2	15	11 07 55.78	106.40	0 50 24.2	773.6				
15	9 43 16.45	111.09	10 41 03.0	720.4	16	11 09 42.18	106.40	0 37 30.6	773.8				
16	9 45 07.54	110.90	10 29 02.6	722.5	17	11 11 28.58	106.41	0 24 36.8	773.9				
17	9 46 58.44	110.71	10 17 00.1	724.6	18	11 13 14.99	106.40	+ 0 11 42.9	774.0				
18	9 48 49.15	110.54	10 04 55.5	726.6	19	11 15 01.39	106.42	- 0 01 11.1	774.1				
19	9 50 39.69	110.36	9 52 48.9	728.5	20	11 16 47.81	106.43	0 14 05.2	774.1				
20	9 52 30.05	110.18	9 40 40.4	730.6	21	11 18 34.24	106.44	0 26 59.3	774.1				
21	9 54 20.23	110.02	9 28 29.8	732.4	22	11 20 20.68	106.47	0 39 53.4	774.1				
22	9 56 10.25	109.85	9 16 17.4	734.2	23	11 22 07.15	106.50	0 52 47.5	774.0				
23	9 58 00.10	109.68	+ 9 04 03.2	-736.1		11 23 53.65	106.52	- 1 05 41.5	-773.8				
Friday, July 5							Sunday, July 7						
0	9 59 49.78	109.53	+ 8 51 47.1	-737.8	0	11 25 40.17	106.56	- 1 18 35.3	-773.7				
1	10 01 39.31	109.37	8 39 29.3	739.5	1	11 27 26.73	106.60	1 31 29.0	773.5				
2	10 03 28.68	109.22	8 27 09.8	741.2	2	11 29 13.33	106.64	1 44 22.5	773.2				
3	10 05 17.90	109.08	8 14 48.6	742.8	3	11 30 59.97	106.69	1 57 15.7	773.0				
4	10 07 06.98	108.93	8 02 25.8	744.4	4	11 32 46.66	106.74	2 10 08.7	772.6				
5	10 08 55.91	108.79	7 50 01.4	745.9	5	11 34 33.40	106.79	2 23 01.3	772.3				
6	10 10 44.70	108.66	7 37 35.5	747.4	6	11 36 20.19	106.86	2 35 53.6	772.0				
7	10 12 33.36	108.52	7 25 08.1	748.9	7	11 38 07.05	106.92	2 48 45.6	771.5				
8	10 14 21.88	108.40	7 12 39.2	750.3	8	11 39 53.97	106.99	3 01 37.1	771.0				
9	10 16 10.28	108.27	7 00 08.9	751.6	9	11 41 40.96	107.06	3 14 28.1	770.5				
10	10 17 58.55	108.15	6 47 37.3	752.9	10	11 43 28.02	107.15	3 27 18.6	770.0				
11	10 19 46.70	108.03	6 35 04.4	754.2	11	11 45 15.17	107.22	3 40 08.6	769.4				
12	10 21 34.73	107.92	6 22 30.2	755.4	12	11 47 02.39	107.31	3 52 58.0	768.8				
13	10 23 22.65	107.82	6 09 54.8	756.7	13	11 48 49.70	107.40	4 05 46.8	768.1				
14	10 25 10.47	107.71	5 57 18.1	757.8	14	11 50 37.10	107.49	4 18 34.9	767.4				
15	10 26 58.18	107.61	5 44 40.3	758.9	15	11 52 24.59	107.59	4 31 22.3	766.7				
16	10 28 45.79	107.51	5 32 01.4	760.0	16	11 54 12.18	107.70	4 44 09.0	765.9				
17	10 30 33.30	107.41	5 19 21.4	761.0	17	11 55 59.88	107.80	4 56 54.9	765.1				
18	10 32 20.71	107.33	5 06 40.4	762.0	18	11 57 47.68	107.92	5 09 40.0	764.2				
19	10 34 08.04	107.25	4 53 58.4	762.9	19	11 59 35.60	108.03	5 22 24.2	763.3				
20	10 35 55.29	107.16	4 41 15.5	763.9	20	12 01 23.63	108.15	5 35 07.5	762.4				
21	10 37 42.45	107.09	4 28 31.6	764.8	21	12 03 11.78	108.28	5 47 49.9	761.5				
22	10 39 29.54	107.01	4 15 46.8	765.5	22	12 05 00.06	108.40	6 00 31.4	760.4				
23	10 41 16.55	106.95	4 03 01.3	-766.4	23	12 06 48.46	108.54	6 13 11.8	-759.3				
24	10 43 03.50		+ 3 50 14.9		24	12 08 37.00		- 6 25 51.1					

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination					
Monday, July 8							Wednesday, July 10									
0	12	08	37.00	108.68	— 6	25	51.1	0	13	39	27.26	120.25	—15	57	53.2	—650.3
1	12	10	25.68	108.81	6	38	29.3	1	13	41	27.51	120.59	16	08	43.5	646.6
2	12	12	14.49	108.97	6	51	06.4	2	13	43	28.10	120.93	16	19	30.1	643.1
3	12	14	03.46	109.11	7	03	42.4	3	13	45	29.03	121.27	16	30	13.2	639.3
4	12	15	52.57	109.27	7	16	17.1	4	13	47	30.30	121.63	16	40	52.5	635.5
5	12	17	41.84	109.43	7	28	50.5	5	13	49	31.93	121.97	16	51	28.0	631.7
6	12	19	31.27	109.59	7	41	22.6	6	13	51	33.90	122.33	17	01	59.7	627.8
7	12	21	20.86	109.76	7	53	53.4	7	13	53	36.23	122.69	17	12	27.5	623.9
8	12	23	10.62	109.93	8	06	22.8	8	13	55	38.92	123.05	17	22	51.4	619.8
9	12	25	00.55	110.11	8	18	50.7	9	13	57	41.97	123.42	17	33	11.2	615.6
10	12	26	50.66	110.29	8	31	17.1	10	13	59	45.39	123.78	17	43	26.8	611.5
11	12	28	40.95	110.47	8	43	42.0	11	14	01	49.17	124.15	17	53	38.3	607.3
12	12	30	31.42	110.66	8	56	05.4	12	14	03	53.32	124.53	18	03	45.6	602.9
13	12	32	22.08	110.86	9	08	27.1	13	14	05	57.85	124.90	18	13	48.5	598.6
14	12	34	12.94	111.05	9	20	47.2	14	14	08	02.75	125.28	18	23	47.1	594.1
15	12	36	03.99	111.26	9	33	05.6	15	14	10	08.03	125.67	18	33	41.2	589.6
16	12	37	55.25	111.46	9	45	22.2	16	14	12	13.70	126.05	18	43	30.8	585.0
17	12	39	46.71	111.67	9	57	37.1	17	14	14	19.75	126.43	18	53	15.8	580.4
18	12	41	38.38	111.89	10	09	50.1	18	14	16	26.18	126.83	19	02	56.2	575.6
19	12	43	30.27	112.11	10	22	01.2	19	14	18	33.01	127.22	19	12	31.8	570.7
20	12	45	22.38	112.33	10	34	10.3	20	14	20	40.23	127.61	19	22	02.5	565.9
21	12	47	14.71	112.55	10	46	17.5	21	14	22	47.84	128.01	19	31	28.4	561.0
22	12	49	07.26	112.79	10	58	22.6	22	14	24	55.85	128.40	19	40	49.4	555.9
23	12	51	00.05	113.03	—11	10	25.7	23	14	27	04.25	128.81	—19	50	05.3	—550.8
Tuesday, July 9							Thursday, July 11									
0	12	52	53.08	113.27	—11	22	26.6	0	14	29	13.06	129.21	—19	59	16.1	—545.6
1	12	54	46.35	113.51	11	34	25.3	1	14	31	22.27	129.61	20	08	21.7	540.4
2	12	56	39.86	113.76	11	46	21.8	2	14	33	31.88	130.02	20	17	22.1	535.1
3	12	58	33.62	114.01	11	58	16.0	3	14	35	41.90	130.43	20	26	17.2	529.6
4	13	00	27.63	114.27	12	10	07.9	4	14	37	52.33	130.84	20	35	06.8	524.1
5	13	02	21.90	114.53	12	21	57.4	5	14	40	03.17	131.25	20	43	50.9	518.6
6	13	04	16.43	114.80	12	33	44.5	6	14	42	14.42	131.66	20	52	29.5	513.0
7	13	06	11.23	115.06	12	45	29.1	7	14	44	26.08	132.08	21	01	02.5	507.2
8	13	08	06.29	115.34	12	57	11.1	8	14	46	38.16	132.49	21	09	29.7	501.4
9	13	10	01.63	115.62	13	08	50.5	9	14	48	50.65	132.90	21	17	51.1	495.5
10	13	11	57.25	115.90	13	20	27.3	10	14	51	03.55	133.32	21	26	06.6	489.6
11	13	13	53.15	116.18	13	32	01.4	11	14	53	16.87	133.74	21	34	16.2	483.5
12	13	15	49.33	116.47	13	43	32.8	12	14	55	30.61	134.16	21	42	19.7	477.4
13	13	17	45.80	116.77	13	55	01.3	13	14	57	44.77	134.57	21	50	17.1	471.2
14	13	19	42.57	117.07	14	06	27.0	14	14	59	59.34	135.00	21	58	08.3	464.9
15	13	21	39.64	117.37	14	17	49.8	15	15	02	14.34	135.41	22	05	53.2	458.6
16	13	23	37.01	117.67	14	29	09.5	16	15	04	29.75	135.83	22	13	31.8	452.1
17	13	25	34.68	117.98	14	40	26.3	17	15	06	45.58	136.25	22	21	03.9	445.6
18	13	27	32.66	118.30	14	51	39.9	18	15	09	01.83	136.67	22	28	29.5	439.0
19	13	29	30.96	118.61	15	02	50.3	19	15	11	18.50	137.09	22	35	48.5	432.3
20	13	31	29.57	118.93	15	13	57.6	20	15	13	35.59	137.50	22	43	00.8	425.6
21	13	33	28.50	119.26	15	25	01.5	21	15	15	53.09	137.92	22	50	06.4	418.7
22	13	35	27.76	119.58	15	36	02.2	22	15	18	11.01	138.34	22	57	05.1	411.7
23	13	37	27.34	119.92	15	46	59.4	23	15	20	29.35	138.75	23	03	56.8	—404.8
24	13	39	27.26		—15	57	53.2	24	15	22	48.10		—23	10	41.6	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Friday, July 12					Sunday, July 14				
0	^h 15 ^m 22 ^s 48.10	[°] 139.17	[°] 23 10' 41".6	-397.7	0	^h 17 ^m 20 ^s 58.80	[°] 154.65	[°] 25 51' 48.9	+29.5
1	15 25 07.27	139.58	23 17 19.3	390.5	1	17 23 33.45	154.82	25 51 19.4	39.8
2	15 27 26.85	139.99	23 23 49.8	383.2	2	17 26 08.27	154.97	25 50 39.6	50.1
3	15 29 46.84	140.41	23 30 13.0	375.9	3	17 28 43.24	155.13	25 49 49.5	60.5
4	15 32 07.25	140.81	23 36 28.9	368.5	4	17 31 18.37	155.27	25 48 49.0	70.9
5	15 34 28.06	141.22	23 42 37.4	360.9	5	17 33 53.64	155.40	25 47 38.1	81.3
6	15 36 49.28	141.62	23 48 38.3	353.4	6	17 36 29.04	155.53	25 46 16.8	91.7
7	15 39 10.90	142.02	23 54 31.7	345.8	7	17 39 04.57	155.65	25 44 45.1	102.1
8	15 41 32.92	142.43	24 00 17.5	337.9	8	17 41 40.22	155.75	25 43 03.0	112.6
9	15 43 55.35	142.82	24 05 55.4	330.2	9	17 44 15.97	155.86	25 41 10.4	123.1
10	15 46 18.17	143.22	24 11 25.6	322.2	10	17 46 51.83	155.95	25 39 07.3	133.6
11	15 48 41.39	143.61	24 16 47.8	314.3	11	17 49 27.78	156.03	25 36 53.7	144.1
12	15 51 05.00	144.00	24 22 02.1	306.2	12	17 52 03.81	156.10	25 34 29.6	154.6
13	15 53 29.00	144.39	24 27 08.3	298.1	13	17 54 39.91	156.17	25 31 55.0	165.2
14	15 55 53.39	144.77	24 32 06.4	289.9	14	17 57 16.08	156.23	25 29 09.8	175.7
15	15 58 18.16	145.15	24 36 56.3	281.5	15	17 59 52.31	156.27	25 26 14.1	186.2
16	16 00 43.31	145.53	24 41 37.8	273.2	16	18 02 28.58	156.32	25 23 07.9	196.8
17	16 03 08.84	145.89	24 46 11.0	264.7	17	18 05 04.90	156.34	25 19 51.1	207.3
18	16 05 34.73	146.27	24 50 35.7	256.2	18	18 07 41.24	156.37	25 16 23.8	217.8
19	16 08 01.00	146.62	24 54 51.9	247.7	19	18 10 17.61	156.38	25 12 46.0	228.4
20	16 10 27.62	146.99	24 58 59.6	238.9	20	18 12 53.99	156.38	25 08 57.6	238.9
21	16 12 54.61	147.34	25 02 58.5	230.2	21	18 15 30.37	156.38	25 04 58.7	249.4
22	16 15 21.95	147.69	25 06 48.7	221.3	22	18 18 06.75	156.37	25 00 49.3	259.8
23	16 17 49.64	148.04	-25 10 30.0	-212.5	23	18 20 43.12	156.34	-24 56 29.5	+270.4
Saturday, July 13					Monday, July 15				
0	16 20 17.68	148.38	-25 14 02.5	-203.5	0	18 23 19.46	156.32	-24 51 59.1	+280.8
1	16 22 46.06	148.71	25 17 26.0	194.5	1	18 25 55.78	156.27	24 47 18.3	291.3
2	16 25 14.77	149.04	25 20 40.5	185.4	2	18 28 32.05	156.23	24 42 27.0	301.7
3	16 27 43.81	149.37	25 23 45.9	176.2	3	18 31 08.28	156.18	24 37 25.3	312.1
4	16 30 13.18	149.69	25 26 42.1	166.9	4	18 33 44.46	156.11	24 32 13.2	322.4
5	16 32 42.87	149.99	25 29 29.0	157.7	5	18 36 20.57	156.05	24 26 50.8	332.8
6	16 35 12.86	150.31	25 32 06.7	148.4	6	18 38 56.62	155.96	24 21 18.0	343.1
7	16 37 43.17	150.60	25 34 35.1	138.9	7	18 41 32.58	155.88	24 15 34.9	353.3
8	16 40 13.77	150.90	25 36 54.0	129.4	8	18 44 08.46	155.79	24 09 41.6	363.6
9	16 42 44.67	151.19	25 39 03.4	119.9	9	18 46 44.25	155.68	24 03 38.0	373.7
10	16 45 15.86	151.47	25 41 03.3	110.2	10	18 49 19.93	155.58	23 57 24.3	383.9
11	16 47 47.33	151.74	25 42 53.5	100.6	11	18 51 55.51	155.46	23 51 00.4	394.1
12	16 50 19.07	152.01	25 44 34.1	90.9	12	18 54 30.97	155.34	23 44 26.3	404.1
13	16 52 51.08	152.28	25 46 05.0	81.1	13	18 57 06.31	155.20	23 37 42.2	414.1
14	16 55 23.36	152.52	25 47 26.1	71.3	14	18 59 41.51	155.07	23 30 48.1	424.2
15	16 57 55.88	152.78	25 48 37.4	61.4	15	19 02 16.58	154.92	23 23 43.9	434.0
16	17 00 28.66	153.01	25 49 38.8	51.4	16	19 04 51.50	154.77	23 16 29.9	443.9
17	17 03 01.67	153.24	25 50 30.2	41.5	17	19 07 26.27	154.62	23 09 06.0	453.8
18	17 05 34.91	153.47	25 51 11.7	31.5	18	19 10 00.89	154.45	23 01 32.2	463.4
19	17 08 08.38	153.68	25 51 43.2	21.4	19	19 12 35.34	154.28	22 53 48.8	473.2
20	17 10 42.06	153.89	25 52 04.6	11.4	20	19 15 09.62	154.11	22 45 55.6	482.8
21	17 13 15.95	154.09	25 52 16.0	1.4	21	19 17 43.73	153.92	22 37 52.8	492.3
22	17 15 50.04	154.29	25 52 17.1	-9.0	22	19 20 17.65	153.73	22 29 40.5	501.9
23	17 18 24.33	154.47	25 52 08.1	+19.2	23	19 22 51.38	153.54	22 21 18.6	+511.4
24	17 20 58.80		-25 51 48.9		24	19 25 24.92		-22 12 47.2	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Tuesday, July 16					Thursday, July 18				
0	19 25 24.92	153.34	-22 12 47.2	+520.7	0	21 23 18.34	140.62	-12 46 44.8	+863.0
1	19 27 58.26	153.14	22 04 06.5	530.0	1	21 25 38.96	140.36	12 32 21.8	867.6
2	19 30 31.40	152.92	21 55 16.5	539.3	2	21 27 59.32	140.09	12 17 54.2	872.0
3	19 33 04.32	152.71	21 46 17.2	548.4	3	21 30 19.41	139.83	12 03 22.2	876.3
4	19 35 37.03	152.49	21 37 08.8	557.4	4	21 32 39.24	139.57	11 48 45.9	880.5
5	19 38 09.52	152.26	21 27 51.4	566.5	5	21 34 58.81	139.32	11 34 05.4	884.6
6	19 40 41.78	152.04	21 18 24.9	575.4	6	21 37 18.13	139.06	11 19 20.8	888.6
7	19 43 13.82	151.80	21 08 49.5	584.2	7	21 39 37.19	138.80	11 04 32.2	892.4
8	19 45 45.62	151.57	20 59 05.3	593.0	8	21 41 55.99	138.56	10 49 39.8	896.2
9	19 48 17.19	151.33	20 49 12.3	601.7	9	21 44 14.55	138.31	10 34 43.6	899.8
10	19 50 48.52	151.08	20 39 10.6	610.2	10	21 46 32.86	138.07	10 19 43.8	903.3
11	19 53 19.60	150.83	20 29 00.4	618.8	11	21 48 50.93	137.83	10 04 40.5	906.8
12	19 55 50.43	150.58	20 18 41.6	627.2	12	21 51 08.76	137.59	9 49 33.7	910.1
13	19 58 21.01	150.33	20 08 14.4	635.5	13	21 53 26.35	137.36	9 34 23.6	913.2
14	20 00 51.34	150.06	19 57 38.9	643.8	14	21 55 43.71	137.13	9 19 10.4	916.3
15	20 03 21.40	149.81	19 46 55.1	651.9	15	21 58 00.84	136.90	9 03 54.1	919.2
16	20 05 51.21	149.54	19 36 03.2	659.9	16	22 00 17.74	136.68	8 48 34.9	922.1
17	20 08 20.75	149.27	19 25 03.3	667.9	17	22 02 34.42	136.46	8 33 12.8	924.9
18	20 10 50.02	149.01	19 13 55.4	675.8	18	22 04 50.88	136.24	8 17 47.9	927.5
19	20 13 19.03	148.73	19 02 39.6	683.5	19	22 07 07.12	136.02	8 02 20.4	930.0
20	20 15 47.76	148.46	18 51 16.1	691.2	20	22 09 23.14	135.82	7 46 50.4	932.5
21	20 18 16.22	148.19	18 39 44.9	698.7	21	22 11 38.96	135.61	7 31 17.9	934.7
22	20 20 44.41	147.91	18 28 06.2	706.3	22	22 13 54.57	135.41	7 15 43.2	937.0
23	20 23 12.32	147.63	-18 16 19.9	+713.6	23	22 16 09.98	135.21	-7 00 06.2	+939.0
Wednesday, July 17					Friday, July 19				
0	20 25 39.95	147.35	-18 04 26.3	+720.9	0	22 18 25.19	135.02	-6 44 27.2	+941.0
1	20 28 07.30	147.07	17 52 25.4	728.0	1	22 20 40.21	134.82	6 28 46.2	942.9
2	20 30 34.37	146.79	17 40 17.4	735.1	2	22 22 55.03	134.64	6 13 03.3	944.6
3	20 33 01.16	146.50	17 28 02.3	742.0	3	22 25 09.67	134.45	5 57 18.7	946.3
4	20 35 27.66	146.22	17 15 40.3	748.9	4	22 27 24.12	134.28	5 41 32.4	947.8
5	20 37 53.88	145.94	17 03 11.4	755.6	5	22 29 38.40	134.10	5 25 44.6	949.2
6	20 40 19.82	145.66	16 50 35.8	762.3	6	22 31 52.50	133.93	5 09 55.4	950.6
7	20 42 45.48	145.36	16 37 53.5	768.8	7	22 34 06.43	133.76	4 54 04.8	951.9
8	20 45 10.84	145.09	16 25 04.7	775.2	8	22 36 20.19	133.60	4 38 12.9	952.9
9	20 47 35.93	144.80	16 12 09.5	781.5	9	22 38 33.79	133.44	4 22 20.0	954.0
10	20 50 00.73	144.51	15 59 08.0	787.8	10	22 40 47.23	133.29	4 06 26.0	954.9
11	20 52 25.24	144.23	15 46 00.2	793.8	11	22 43 00.52	133.13	3 50 31.1	955.7
12	20 54 49.47	143.94	15 32 46.4	799.9	12	22 45 13.65	132.99	3 34 35.4	956.4
13	20 57 13.41	143.66	15 19 26.5	805.7	13	22 47 26.64	132.85	3 18 39.0	957.0
14	20 59 37.07	143.38	15 06 00.8	811.5	14	22 49 39.49	132.71	3 02 42.0	957.5
15	21 02 00.45	143.10	14 52 29.3	817.1	15	22 51 52.20	132.58	2 46 44.5	958.0
16	21 04 23.55	142.82	14 38 52.2	822.7	16	22 54 04.78	132.45	2 30 46.5	958.2
17	21 06 46.37	142.54	14 25 09.5	828.1	17	22 56 17.23	132.33	2 14 48.3	958.4
18	21 09 08.91	142.26	14 11 21.4	833.4	18	22 58 29.56	132.21	1 58 49.9	958.6
19	21 11 31.17	141.98	13 57 28.0	838.7	19	23 00 41.77	132.09	1 42 51.3	958.5
20	21 13 53.15	141.71	13 43 29.3	843.7	20	23 02 53.86	131.98	1 26 52.8	958.5
21	21 16 14.86	141.43	13 29 25.6	848.8	21	23 05 05.84	131.88	1 10 54.3	958.2
22	21 18 36.29	141.16	13 15 16.8	853.6	22	23 07 17.72	131.77	0 54 56.1	958.0
23	21 20 57.45	140.89	13 01 03.2	+858.4	23	23 09 29.49	131.68	0 38 58.1	+957.5
24	21 23 18.34		-12 46 44.8		24	23 11 41.17		-0 23 00.6	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Saturday, July 20			Monday, July 22		
0	^{h m} 23 11 41.17 ^s 131.59	— 0 23 00.6	0	^{h m} 0 56 32.36 ^s 132.11	+11 45 32.3
1	23 13 52.76 131.59	— 0 07 03.5	1	0 58 44.47 132.22	11 59 21.5
2	23 16 04.25 131.41	+ 0 08 52.9	2	1 00 56.69 132.32	12 13 06.1
3	23 18 15.66 131.34	0 24 48.7	3	1 03 09.01 132.43	12 26 45.9
4	23 20 27.00 131.26	0 40 43.8	4	1 05 21.44 132.54	12 40 21.0
5	23 22 38.26 131.18	0 56 37.9	5	1 07 33.98 132.66	12 53 51.2
6	23 24 49.44 131.12	1 12 31.0	6	1 09 46.64 132.77	13 07 16.5
7	23 27 00.56 131.06	1 28 23.1	7	1 11 59.41 132.90	13 20 36.8
8	23 29 11.62 131.01	1 44 14.1	8	1 14 12.31 133.01	13 33 52.1
9	23 31 22.63 130.95	2 00 03.7	9	1 16 25.32 133.14	13 47 02.2
10	23 33 33.58 130.90	2 15 52.1	10	1 18 38.46 133.26	14 00 07.1
11	23 35 44.48 130.85	2 31 39.0	11	1 20 51.72 133.40	14 13 06.7
12	23 37 55.33 130.82	2 47 24.4	12	1 23 05.12 133.53	14 26 00.9
13	23 40 06.15 130.78	3 03 08.2	13	1 25 18.65 133.66	14 38 49.7
14	23 42 16.93 130.75	3 18 50.3	14	1 27 32.31 133.79	14 51 33.1
15	23 44 27.68 130.72	3 34 30.5	15	1 29 46.10 133.94	15 04 10.9
16	23 46 38.40 130.70	3 50 08.9	16	1 32 00.04 134.07	15 16 43.1
17	23 48 49.10 130.69	4 05 45.3	17	1 34 14.11 134.22	15 29 09.6
18	23 50 59.79 130.67	4 21 19.6	18	1 36 28.33 134.36	15 41 30.3
19	23 53 10.46 130.66	4 36 51.8	19	1 38 42.69 134.50	15 53 45.3
20	23 55 21.12 130.66	4 52 21.8	20	1 40 57.19 134.65	16 05 54.3
21	23 57 31.78 130.65	5 07 49.4	21	1 43 11.84 134.80	16 17 57.4
22	23 59 42.43 130.66	5 23 14.6	22	1 45 26.64 134.95	16 29 54.5
23	0 01 53.09 130.67	+ 5 38 37.4	23	1 47 41.59 135.10	+16 41 45.5
Sunday, July 21			Tuesday, July 23		
0	0 04 03.76 130.68	+ 5 53 57.5	0	1 49 56.69 135.25	+16 53 30.4
1	0 06 14.44 130.70	6 09 15.0	1	1 52 11.94 135.41	17 05 09.1
2	0 08 25.14 130.72	6 24 29.7	2	1 54 27.35 135.56	17 16 41.5
3	0 10 35.86 130.73	6 39 41.6	3	1 56 42.91 135.72	17 28 07.6
4	0 12 46.59 130.77	6 54 50.5	4	1 58 58.63 135.87	17 39 27.3
5	0 14 57.36 130.80	7 09 56.5	5	2 01 14.50 136.03	17 50 40.5
6	0 17 08.16 130.83	7 24 59.4	6	2 03 30.53 136.19	18 01 47.3
7	0 19 18.99 130.87	7 39 59.1	7	2 05 46.72 136.34	18 12 47.5
8	0 21 29.86 130.92	7 54 55.5	8	2 08 03.06 136.50	18 23 41.0
9	0 23 40.78 130.97	8 09 48.6	9	2 10 19.56 136.67	18 34 27.9
10	0 25 51.75 131.02	8 24 38.3	10	2 12 36.23 136.82	18 45 08.0
11	0 28 02.77 131.08	8 39 24.6	11	2 14 53.05 136.98	18 55 41.4
12	0 30 13.85 131.13	8 54 07.2	12	2 17 10.03 137.14	19 06 07.8
13	0 32 24.98 131.20	9 08 46.2	13	2 19 27.17 137.30	19 16 27.4
14	0 34 36.18 131.26	9 23 21.5	14	2 21 44.47 137.46	19 26 39.9
15	0 36 47.44 131.33	9 37 53.0	15	2 24 01.93 137.63	19 36 45.5
16	0 38 58.77 131.41	9 52 20.6	16	2 26 19.56 137.78	19 46 44.0
17	0 41 10.18 131.48	10 06 44.2	17	2 28 37.34 137.93	19 56 35.3
18	0 43 21.66 131.56	10 21 03.8	18	2 30 55.27 138.10	20 06 19.5
19	0 45 33.22 131.65	10 35 19.3	19	2 33 13.37 138.25	20 15 56.4
20	0 47 44.87 131.73	10 49 30.6	20	2 35 31.62 138.41	20 25 26.0
21	0 49 56.60 131.82	11 03 37.6	21	2 37 50.03 138.57	20 34 48.3
22	0 52 08.43 131.92	11 17 40.3	22	2 40 08.60 138.72	20 44 03.2
23	0 54 20.35 132.01	11 31 38.5	23	2 42 27.32 138.87	20 53 10.6
24	0 56 32.36 132.11	+11 45 32.3	24	2 44 46.19 139.01	+21 02 10.6

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Wednesday, July 24			Friday, July 26		
0	^{h m s} 2 44 46.19 139.03	^{° ' "} +21 02 10.6 +532.4	0	^{h m s} 4 38 05.11 142.93	^{° ' "} +25 34 46.4 +130.8
1	2 47 05.22 139.07	21 11 03.0 524.9	1	4 40 28.04 142.91	25 36 57.2 122.1
2	2 49 24.39 139.17	21 19 47.9 517.2	2	4 42 50.95 142.88	25 38 59.3 113.2
3	2 51 43.72 139.33	21 28 25.1 509.5	3	4 45 13.83 142.84	25 40 52.5 104.5
4	2 54 03.20 139.48	21 36 54.6 501.8	4	4 47 36.67 142.81	25 42 37.0 95.7
5	2 56 22.82 139.62	21 45 16.4 494.1	5	4 49 59.48 142.75	25 44 12.7 86.9
6	2 58 42.59 139.77	21 53 30.5 486.2	6	4 52 22.23 142.71	25 45 39.6 78.2
7	3 01 02.50 140.05	22 01 36.7 478.4	7	4 54 44.94 142.65	25 46 57.8 69.4
8	3 03 22.55 140.19	22 09 35.1 470.5	8	4 57 07.59 142.59	25 48 07.2 60.7
9	3 05 42.74 140.33	22 17 25.6 462.5	9	4 59 30.18 142.52	25 49 07.9 52.0
10	3 08 03.07 140.46	22 25 08.1 454.6	10	5 01 52.70 142.46	25 49 59.9 43.3
11	3 10 23.53 140.59	22 32 42.7 446.5	11	5 04 15.16 142.37	25 50 43.2 34.5
12	3 12 44.12 140.72	22 40 09.2 438.5	12	5 06 37.53 142.29	25 51 17.7 25.9
13	3 15 04.84 140.85	22 47 27.7 430.4	13	5 08 59.82 142.20	25 51 43.6 17.2
14	3 17 25.69 140.98	22 54 38.1 422.2	14	5 11 22.02 142.11	25 52 00.8 + 8.5
15	3 19 46.67 141.09	23 01 40.3 414.1	15	5 13 44.13 142.01	25 52 09.3 - 0.1
16	3 22 07.76 141.21	23 08 34.4 405.9	16	5 16 06.14 141.91	25 52 09.2 8.7
17	3 24 28.97 141.33	23 15 20.3 397.6	17	5 18 28.05 141.80	25 52 00.5 17.4
18	3 26 50.30 141.44	23 21 57.9 389.3	18	5 20 49.85 141.68	25 51 43.1 25.9
19	3 29 11.74 141.55	23 28 27.2 381.1	19	5 23 11.53 141.56	25 51 17.2 34.4
20	3 31 33.29 141.66	23 34 48.3 372.7	20	5 25 33.09 141.44	25 50 42.8 43.0
21	3 33 54.95 141.75	23 41 01.0 364.3	21	5 27 54.53 141.31	25 49 59.8 51.6
22	3 36 16.70 141.86	23 47 05.3 356.0	22	5 30 15.84 141.18	25 49 08.2 60.0
23	3 38 38.56 141.95	+23 53 01.3 +347.5	23	5 32 37.02 141.03	+25 48 08.2 - 68.5
Thursday, July 25			Saturday, July 27		
0	^{h m s} 3 41 00.51 142.04	^{° ' "} +23 58 48.8 +339.1	0	^{h m s} 5 34 58.05 140.89	^{° ' "} +25 46 59.7 - 76.9
1	3 43 22.55 142.13	24 04 27.9 330.5	1	5 37 18.94 140.74	25 45 42.8 85.3
2	3 45 44.68 142.22	24 09 58.4 322.1	2	5 39 39.68 140.59	25 44 17.5 93.7
3	3 48 06.90 142.29	24 15 20.5 313.5	3	5 42 00.27 140.42	25 42 43.8 102.1
4	3 50 29.19 142.38	24 20 34.0 305.0	4	5 44 20.69 140.26	25 41 01.7 110.4
5	3 52 51.57 142.44	24 25 39.0 296.5	5	5 46 40.95 140.10	25 39 11.3 118.7
6	3 55 14.01 142.51	24 30 35.5 287.8	6	5 49 01.05 139.91	25 37 12.6 126.9
7	3 57 36.52 142.57	24 35 23.3 279.2	7	5 51 20.96 139.74	25 35 05.7 135.1
8	3 59 59.09 142.64	24 40 02.5 270.6	8	5 53 40.70 139.56	25 32 50.6 143.3
9	4 02 21.73 142.68	24 44 33.1 261.9	9	5 56 00.26 139.37	25 30 27.3 151.4
10	4 04 44.41 142.74	24 48 55.0 253.2	10	5 58 19.63 139.18	25 27 55.9 159.6
11	4 07 07.15 142.78	24 53 08.2 244.6	11	6 00 38.81 138.98	25 25 16.3 167.6
12	4 09 29.93 142.82	24 57 12.8 235.9	12	6 02 57.79 138.78	25 22 28.7 175.6
13	4 11 52.75 142.86	25 01 08.7 227.2	13	6 05 16.57 138.58	25 19 33.1 183.7
14	4 14 15.61 142.89	25 04 55.9 218.4	14	6 07 35.15 138.37	25 16 29.4 191.6
15	4 16 38.50 142.92	25 08 34.3 209.8	15	6 09 53.52 138.15	25 13 17.8 199.5
16	4 19 01.42 142.94	25 12 04.1 200.9	16	6 12 11.67 137.94	25 09 58.3 207.3
17	4 21 24.36 142.95	25 15 25.0 192.2	17	6 14 29.61 137.72	25 06 31.0 215.2
18	4 23 47.31 142.97	25 18 37.2 183.5	18	6 16 47.33 137.49	25 02 55.8 223.0
19	4 26 10.28 142.97	25 21 40.7 174.7	19	6 19 04.82 137.27	24 59 12.8 230.6
20	4 28 33.25 142.98	25 24 35.4 165.9	20	6 21 22.09 137.03	24 55 22.2 238.4
21	4 30 56.23 142.97	25 27 21.3 157.2	21	6 23 39.12 136.80	24 51 23.8 246.0
22	4 33 19.20 142.96	25 29 58.5 148.3	22	6 25 55.92 136.56	24 47 17.8 253.6
23	4 35 42.16 142.95	25 32 26.8 +139.6	23	6 28 12.48 136.32	24 43 04.2 - 261.2
24	4 38 05.11	+25 34 46.4	24	6 30 28.80	+24 38 43.0

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Sunday, July 28			Tuesday, July 30		
0	^{h m} 6 30 28.80 ^s 136.07	+24 38 43.0	0	^{h m} 8 14 05.46 ^s 122.33	+18 59 30.0
1	6 32 44.87 135.83	24 34 14.4	1	8 16 07.79 122.04	18 50 06.8
2	6 35 00.70 135.57	24 29 38.3	2	8 18 09.83 121.75	18 40 38.8
3	6 37 16.27 135.31	24 24 54.8	3	8 20 11.58 121.47	18 31 06.3
4	6 39 31.58 135.06	24 20 03.9	4	8 22 13.05 121.18	18 21 29.2
5	6 41 46.64 134.80	24 15 05.8	5	8 24 14.23 120.89	18 11 47.6
6	6 44 01.44 134.54	24 10 00.4	6	8 26 15.12 120.61	18 02 01.5
7	6 46 15.98 134.27	24 04 47.8	7	8 28 15.73 120.33	17 52 11.1
8	6 48 30.25 134.00	23 59 28.0	8	8 30 16.06 120.05	17 42 16.3
9	6 50 44.25 133.74	23 54 01.2	9	8 32 16.11 119.78	17 32 17.3
10	6 52 57.99 133.46	23 48 27.3	10	8 34 15.89 119.49	17 22 14.0
11	6 55 11.45 133.18	23 42 46.5	11	8 36 15.38 119.22	17 12 06.6
12	6 57 24.63 132.91	23 36 58.7	12	8 38 14.60 118.95	17 01 55.1
13	6 59 37.54 132.62	23 31 04.0	13	8 40 13.55 118.67	16 51 39.6
14	7 01 50.16 132.35	23 25 02.6	14	8 42 12.22 118.41	16 41 20.1
15	7 04 02.51 132.06	23 18 54.3	15	8 44 10.63 118.14	16 30 56.6
16	7 06 14.57 131.78	23 12 39.4	16	8 46 08.77 117.87	16 20 29.3
17	7 08 26.35 131.49	23 06 17.8	17	8 48 06.64 117.61	16 09 58.2
18	7 10 37.84 131.21	22 59 49.6	18	8 50 04.25 117.35	15 59 23.4
19	7 12 49.05 130.92	22 53 14.9	19	8 52 01.60 117.10	15 48 44.8
20	7 14 59.97 130.62	22 46 33.6	20	8 53 58.70 116.83	15 38 02.6
21	7 17 10.59 130.34	22 39 46.0	21	8 55 55.53 116.58	15 27 16.9
22	7 19 20.93 130.04	22 32 52.0	22	8 57 52.11 116.33	15 16 27.6
23	7 21 30.97 129.75	+22 25 51.7	23	8 59 48.44 116.08	+15 05 34.8
Monday, July 29			Wednesday, July 31		
0	7 23 40.72 129.46	+22 18 45.2	0	9 01 44.52 115.83	+14 54 38.7
1	7 25 50.18 129.15	22 11 32.5	1	9 03 40.35 115.59	14 43 39.2
2	7 27 59.33 128.86	22 04 13.7	2	9 05 35.94 115.35	14 32 36.4
3	7 30 08.19 128.57	21 56 48.7	3	9 07 31.29 115.10	14 21 30.4
4	7 32 16.76 128.27	21 49 17.8	4	9 09 26.39 114.87	14 10 21.1
5	7 34 25.03 127.96	21 41 40.9	5	9 11 21.26 114.64	13 59 08.7
6	7 36 32.99 127.67	21 33 58.2	6	9 13 15.90 114.41	13 47 53.3
7	7 38 40.66 127.38	21 26 09.6	7	9 15 10.31 114.18	13 36 34.8
8	7 40 48.04 127.07	21 18 15.2	8	9 17 04.49 113.95	13 25 13.3
9	7 42 55.11 126.78	21 10 15.1	9	9 18 58.44 113.73	13 13 48.9
10	7 45 01.89 126.47	21 02 09.4	10	9 20 52.17 113.50	13 02 21.6
11	7 47 08.36 126.18	20 53 58.1	11	9 22 45.67 113.29	12 50 51.5
12	7 49 14.54 125.88	20 45 41.3	12	9 24 38.96 113.08	12 39 18.7
13	7 51 20.42 125.58	20 37 19.0	13	9 26 32.04 112.86	12 27 43.1
14	7 53 26.00 125.28	20 28 51.3	14	9 28 24.90 112.65	12 16 04.9
15	7 55 31.28 124.98	20 20 18.3	15	9 30 17.55 112.45	12 04 24.1
16	7 57 36.26 124.68	20 11 39.9	16	9 32 10.00 112.24	11 52 40.7
17	7 59 40.94 124.39	20 02 56.3	17	9 34 02.24 112.05	11 40 54.9
18	8 01 45.33 124.09	19 54 07.6	18	9 35 54.29 111.85	11 29 06.5
19	8 03 49.42 123.80	19 45 13.7	19	9 37 46.14 111.65	11 17 15.8
20	8 05 53.22 123.50	19 36 14.8	20	9 39 37.79 111.46	11 05 22.7
21	8 07 56.72 123.21	19 27 11.0	21	9 41 29.25 111.28	10 53 27.3
22	8 09 59.93 122.91	19 18 02.2	22	9 43 20.53 111.09	10 41 29.6
23	8 12 02.84 122.62	19 08 48.5	23	9 45 11.62 110.91	10 29 29.7
24	8 14 05.46	+18 59 30.0	24	9 47 02.53	+10 17 27.7

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Thursday, August 1			Saturday, August 3		
0	^{h m s} 9 47 02.53	^{° ' "} +10 17 27.7	0	^{h m s} 11 13 19.74	^{° ' "} + 0 12 42.2
1	9 48 53.26	10 05 23.6	1	11 15 06.01	0 00 09.9
2	9 50 43.82	9 53 17.4	2	11 16 52.28	0 13 02.0
3	9 52 34.20	9 41 09.2	3	11 18 38.54	0 25 54.0
4	9 54 24.42	9 28 59.1	4	11 20 24.82	0 38 46.0
5	9 56 14.47	9 16 47.1	5	11 22 11.10	0 51 37.7
6	9 58 04.36	9 04 33.2	6	11 23 57.39	1 04 29.3
7	9 59 54.09	8 52 17.4	7	11 25 43.70	1 17 20.7
8	10 01 43.67	8 39 59.9	8	11 27 30.03	1 30 11.8
9	10 03 33.09	8 27 40.7	9	11 29 16.39	1 43 02.5
10	10 05 22.37	8 15 19.8	10	11 31 02.77	1 55 53.0
11	10 07 11.50	8 02 57.2	11	11 32 49.18	2 08 43.0
12	10 09 00.49	7 50 33.1	12	11 34 35.63	2 21 32.6
13	10 10 49.34	7 38 07.4	13	11 36 22.12	2 34 21.7
14	10 12 38.06	7 25 40.3	14	11 38 08.65	2 47 10.4
15	10 14 26.65	7 13 11.7	15	11 39 55.22	2 59 58.4
16	10 16 15.10	7 00 41.7	16	11 41 41.85	3 12 45.9
17	10 18 03.44	6 48 10.4	17	11 43 28.54	3 25 32.8
18	10 19 51.65	6 35 37.7	18	11 45 15.28	3 38 19.0
19	10 21 39.75	6 23 03.8	19	11 47 02.09	3 51 04.5
20	10 23 27.73	6 10 28.7	20	11 48 48.96	4 03 49.3
21	10 25 15.60	5 57 52.3	21	11 50 35.91	4 16 33.3
22	10 27 03.37	5 45 14.9	22	11 52 22.93	4 29 16.4
23	10 28 51.03	+ 5 32 36.3	23	11 54 10.02	- 4 41 58.7
	107.56	-759.6		107.18	-761.4
Friday, August 2			Sunday, August 4		
0	10 30 38.59	+ 5 19 56.7	0	12 55 57.20	- 4 54 40.1
1	10 32 26.06	5 07 16.1	1	12 57 44.47	5 07 20.5
2	10 34 13.44	4 54 34.6	2	12 59 31.82	5 20 00.0
3	10 36 00.72	4 41 52.1	3	12 01 19.27	5 32 38.4
4	10 37 47.92	4 29 08.7	4	12 03 06.82	5 45 15.8
5	10 39 35.04	4 16 24.5	5	12 04 54.47	5 57 52.0
6	10 41 22.08	4 03 39.6	6	12 06 42.22	6 10 27.1
7	10 43 09.05	3 50 53.8	7	12 08 30.08	6 23 01.0
8	10 44 55.95	3 38 07.4	8	12 10 18.06	6 35 33.7
9	10 46 42.78	3 25 20.3	9	12 12 06.16	6 48 05.0
10	10 48 29.54	3 12 32.6	10	12 13 54.37	7 00 35.1
11	10 50 16.25	2 59 44.2	11	12 15 42.72	7 13 03.9
12	10 52 02.90	2 46 55.4	12	12 17 31.19	7 25 31.2
13	10 53 49.50	2 34 06.1	13	12 19 19.80	7 37 57.1
14	10 55 36.05	2 21 16.3	14	12 21 08.54	7 50 21.5
15	10 57 22.56	2 08 26.1	15	12 22 57.43	8 02 44.4
16	10 59 09.03	1 55 35.5	16	12 24 46.46	8 15 05.7
17	11 00 55.46	1 42 44.6	17	12 26 35.64	8 27 25.4
18	11 02 41.85	1 29 53.4	18	12 28 24.97	8 39 43.5
19	11 04 28.22	1 17 01.9	19	12 30 14.46	8 51 59.9
20	11 06 14.56	1 04 10.2	20	12 32 04.11	9 04 14.5
21	11 08 00.88	0 51 18.4	21	12 33 53.93	9 16 27.4
22	11 09 47.18	0 38 26.4	22	12 35 43.91	9 28 38.4
23	11 11 33.46	0 25 34.3	23	12 37 34.07	9 40 47.5
24	11 13 19.74	+ 0 12 42.2	24	12 39 24.40	- 9 52 54.8
		-772.1		110.33	-727.3

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Monday, August 5							Wednesday, August 7						
0	h	m	s	°	'	"	0	h	m	s	°	'	"
1	12	39	24.40	110-51	-9	52 54.8	1	14	12	21.94	123-49	-18	41 28.5
2	12	41	14.91	110-70	10	05 00.1	2	14	14	25.43	123-85	18	51 01.0
3	12	43	05.61	110-89	10	17 03.4	3	14	16	29.28	123-85	19	00 29.0
4	12	44	56.50	111-08	10	29 04.6	4	14	18	33.47	124-19	19	09 52.3
5	12	46	47.58	111-27	10	41 03.7	5	14	20	38.02	124-55	19	19 11.0
6	12	48	38.85	111-48	10	53 00.7	6	14	22	42.93	124-91	19	28 24.9
7	12	50	30.33	111-68	11	04 55.6	7	14	24	48.19	125-26	19	37 34.0
8	12	52	22.01	111-88	11	16 48.2	8	14	26	53.82	125-63	19	46 38.1
9	12	54	13.89	112-10	11	28 38.5	9	14	28	59.81	125-99	19	55 37.3
10	12	56	05.99	112-31	11	40 26.5	10	14	31	06.16	126-35	20	04 31.5
11	12	57	58.30	112-54	11	52 12.1	11	14	33	12.88	126-72	20	13 20.6
12	12	59	50.84	112-75	12	03 55.3	12	14	35	19.97	127-09	20	22 04.6
13	13	01	43.59	112-98	12	15 36.1	13	14	37	27.43	127-46	20	30 43.3
14	13	03	36.57	113-22	12	27 14.3	14	14	39	35.26	127-83	20	39 16.7
15	13	05	29.79	113-45	12	38 50.0	15	14	41	43.47	128-21	20	47 44.8
16	13	07	23.24	113-68	12	50 23.1	16	14	43	52.06	128-59	20	56 07.5
17	13	09	16.92	113-93	13	01 53.5	17	14	46	01.02	128-96	21	04 24.6
18	13	11	10.85	114-17	13	13 21.2	18	14	48	10.36	129-34	21	12 36.2
19	13	13	05.02	114-43	13	24 46.1	19	14	50	20.08	129-72	21	20 42.1
20	13	14	59.45	114-67	13	36 08.2	20	14	52	30.18	130-10	21	28 42.3
21	13	16	54.12	114-93	13	47 27.5	21	14	54	40.66	130-48	21	36 36.8
22	13	18	49.05	115-20	13	58 43.9	22	14	56	51.53	130-87	21	44 25.4
23	13	20	44.25	115-46	14	09 57.3	23	14	59	02.78	131-25	21	52 08.1
	13	22	39.71	115-72	-14	21 07.7		15	01	14.42	131-64	-21	59 44.8
						-667.3				132-02			-450.6
Tuesday, August 6							Thursday, August 8						
0	13	24	35.43	116-00	-14	32 15.0	0	15	03	26.44	132-41	-22	07 15.4
1	13	26	31.43	116-27	14	43 19.2	1	15	05	38.85	132-79	22	14 39.9
2	13	28	27.70	116-55	14	54 20.3	2	15	07	51.64	133-19	22	21 58.2
3	13	30	24.25	116-83	15	05 18.1	3	15	10	04.83	133-57	22	29 10.2
4	13	32	21.08	117-11	15	16 12.6	4	15	12	18.40	133-97	22	36 15.9
5	13	34	18.19	117-40	15	27 03.8	5	15	14	32.37	133-97	22	43 15.1
6	13	36	15.59	117-70	15	37 51.6	6	15	16	46.72	134-35	22	50 07.9
7	13	38	13.29	117-99	15	48 36.0	7	15	19	01.45	134-73	22	56 54.1
8	13	40	11.28	118-29	15	59 16.9	8	15	21	16.58	135-13	23	03 33.6
9	13	42	09.57	118-59	16	09 54.2	9	15	23	32.09	135-51	23	10 06.5
10	13	44	08.16	118-90	16	20 27.9	10	15	25	47.99	135-90	23	16 32.5
11	13	46	07.06	119-21	16	30 58.0	11	15	28	04.27	136-28	23	22 51.7
12	13	48	06.27	119-52	16	41 24.3	12	15	30	20.94	136-67	23	29 04.0
13	13	50	05.79	119-83	16	51 46.8	13	15	32	37.99	137-05	23	35 09.3
14	13	52	05.62	120-15	17	02 05.5	14	15	34	55.43	137-44	23	41 07.5
15	13	54	05.77	120-48	17	12 20.3	15	15	37	13.26	137-83	23	46 58.5
16	13	56	06.25	120-79	17	22 31.2	16	15	39	31.46	138-20	23	52 42.3
17	13	58	07.04	121-13	17	32 38.0	17	15	41	50.05	138-59	23	58 18.9
18	14	00	08.17	121-45	17	42 40.8	18	15	44	09.02	138-97	24	03 48.0
19	14	02	09.62	121-79	17	52 39.5	19	15	46	28.36	139-34	24	09 09.8
20	14	04	11.41	122-12	18	02 33.9	20	15	48	48.08	139-72	24	14 24.0
21	14	06	13.53	122-46	18	12 24.1	21	15	51	08.17	140-09	24	19 30.6
22	14	08	15.99	122-80	18	22 10.0	22	15	53	28.63	140-46	24	24 29.6
23	14	10	18.79	123-15	18	31 51.4	23	15	55	49.47	140-84	24	29 20.8
24	14	12	21.94		-18	41 28.5	24	15	58	10.67	141-20	-24	34 04.3

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Friday, August 9			Sunday, August 11		
0	^h 15 ^m 58 ^s 10.67	[°] -24 ['] 34 ["] 04.3	0	^h 17 ^m 57 ^s 01.08	[°] -25 ['] 27 ["] 29.4
1	16 00 32.24	24 38 39.9	1	17 59 34.70	25 24 39.0
2	16 02 54.17	24 43 07.6	2	18 02 08.41	25 21 38.4
3	16 05 16.46	24 47 27.2	3	18 04 42.21	25 18 27.6
4	16 07 39.10	24 51 38.8	4	18 07 16.08	25 15 06.5
5	16 10 02.10	24 55 42.2	5	18 09 50.03	25 11 35.1
6	16 12 25.45	24 59 37.5	6	18 12 24.04	25 07 53.6
7	16 14 49.15	25 03 24.4	7	18 14 58.11	25 04 01.7
8	16 17 13.19	25 07 03.0	8	18 17 32.23	24 59 59.6
9	16 19 37.57	25 10 33.1	9	18 20 06.38	24 55 47.2
10	16 22 02.29	25 13 54.8	10	18 22 40.58	24 51 24.6
11	16 24 27.33	25 17 08.0	11	18 25 14.80	24 46 51.7
12	16 26 52.71	25 20 12.5	12	18 27 49.04	24 42 08.6
13	16 29 18.41	25 23 08.4	13	18 30 23.29	24 37 15.2
14	16 31 44.44	25 25 55.5	14	18 32 57.55	24 32 11.6
15	16 34 10.77	25 28 33.8	15	18 35 31.80	24 26 57.8
16	16 36 37.42	25 31 03.2	16	18 38 06.05	24 21 33.7
17	16 39 04.38	25 33 23.7	17	18 40 40.27	24 15 59.5
18	16 41 31.64	25 35 35.2	18	18 43 14.48	24 10 15.2
19	16 43 59.19	25 37 37.7	19	18 45 48.65	24 04 20.7
20	16 46 27.04	25 39 31.0	20	18 48 22.79	23 58 16.1
21	16 48 55.17	25 41 15.2	21	18 50 56.89	23 52 01.4
22	16 51 23.59	25 42 50.2	22	18 53 30.93	23 45 36.6
23	16 53 52.28	-25 44 15.9	23	18 56 04.91	-23 39 01.8
	148.96	-76.4		153.92	+404.8
Saturday, August 10			Monday, August 12		
0	16 56 21.24	-25 45 32.3	0	18 58 38.83	-23 32 17.0
1	16 58 50.47	25 46 39.3	1	19 01 12.68	23 25 22.2
2	17 01 19.95	25 47 36.9	2	19 03 46.46	23 18 17.5
3	17 03 49.69	25 48 24.9	3	19 06 20.15	23 11 02.9
4	17 06 19.68	25 49 03.4	4	19 08 53.75	23 03 38.4
5	17 08 49.90	25 49 32.4	5	19 11 27.25	22 56 04.1
6	17 11 20.36	25 49 51.7	6	19 14 00.66	22 48 20.1
7	17 13 51.05	25 50 01.4	7	19 16 33.96	22 40 26.3
8	17 16 21.96	25 50 01.3	8	19 19 07.14	22 32 22.9
9	17 18 53.08	25 49 51.5	9	19 21 40.21	22 24 09.8
10	17 21 24.41	25 49 31.9	10	19 24 13.16	22 15 47.2
11	17 23 55.95	25 49 02.4	11	19 26 45.97	22 07 15.0
12	17 26 27.68	25 48 23.1	12	19 29 18.65	21 58 33.4
13	17 28 59.60	25 47 33.9	13	19 31 51.19	21 49 42.4
14	17 31 31.70	25 46 34.7	14	19 34 23.59	21 40 42.0
15	17 34 03.97	25 45 25.5	15	19 36 55.83	21 31 32.3
16	17 36 36.41	25 44 06.3	16	19 39 27.93	21 22 13.4
17	17 39 09.01	25 42 37.1	17	19 41 59.86	21 12 45.3
18	17 41 41.76	25 40 57.8	18	19 44 31.63	21 03 08.2
19	17 44 14.66	25 39 08.4	19	19 47 03.24	20 53 22.0
20	17 46 47.70	25 37 09.0	20	19 49 34.68	20 43 26.8
21	17 49 20.86	25 34 59.4	21	19 52 05.94	20 33 22.8
22	17 51 54.15	25 32 39.6	22	19 54 37.02	20 23 10.0
23	17 54 27.56	25 30 09.6	23	19 57 07.92	20 12 48.4
24	17 57 01.08	-25 27 29.4	24	19 59 38.64	-20 02 18.2
		+160.2		150.72	+630.2

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Tuesday, August 13					Thursday, August 15				
0	^h 19 ^m 59 ^s 38.64	150.53	-20 02 18.2	+638.8	0	^h 21 ^m 56 ^s 02.43	140.30	-9 18 52.5	+935.1
1	20 02 09.17	150.33	19 51 39.4	647.3	1	21 58 22.73	140.11	9 03 17.4	938.4
2	20 04 39.50	150.14	19 40 52.1	655.8	2	22 00 42.84	139.92	8 47 39.0	941.8
3	20 07 09.64	149.94	19 29 56.3	664.0	3	22 03 02.76	139.75	8 31 57.2	945.0
4	20 09 39.58	149.74	19 18 52.3	672.3	4	22 05 22.51	139.57	8 16 12.2	948.0
5	20 12 09.32	149.53	19 07 40.0	680.5	5	22 07 42.08	139.39	8 00 24.2	951.0
6	20 14 38.85	149.33	18 56 19.5	688.6	6	22 10 01.47	139.22	7 44 33.2	953.8
7	20 17 08.18	149.13	18 44 50.9	696.5	7	22 12 20.69	139.05	7 28 39.4	956.5
8	20 19 37.31	148.91	18 33 14.4	704.5	8	22 14 39.74	138.89	7 12 42.9	959.1
9	20 22 06.22	148.70	18 21 29.9	712.3	9	22 16 58.63	138.72	6 56 43.8	961.6
10	20 24 34.92	148.49	18 09 37.6	720.0	10	22 19 17.35	138.56	6 40 42.2	963.9
11	20 27 03.41	148.27	17 57 37.6	727.6	11	22 21 35.91	138.40	6 24 38.3	966.2
12	20 29 31.68	148.05	17 45 30.0	735.1	12	22 23 54.31	138.25	6 08 32.1	968.3
13	20 31 59.73	147.84	17 33 14.9	742.6	13	22 26 12.56	138.10	5 52 23.8	970.2
14	20 34 27.57	147.61	17 20 52.3	750.0	14	22 28 30.66	137.95	5 36 13.6	972.2
15	20 36 55.18	147.39	17 08 22.3	757.1	15	22 30 48.61	137.81	5 20 01.4	973.9
16	20 39 22.57	147.17	16 55 45.2	764.3	16	22 33 06.42	137.68	5 03 47.5	975.5
17	20 41 49.74	146.94	16 43 00.9	771.3	17	22 35 24.10	137.53	4 47 32.0	977.0
18	20 44 16.68	146.73	16 30 09.6	778.3	18	22 37 41.63	137.41	4 31 15.0	978.5
19	20 46 43.41	146.50	16 17 11.3	785.1	19	22 39 59.04	137.27	4 14 56.5	979.7
20	20 49 09.91	146.27	16 04 06.2	791.8	20	22 42 16.31	137.15	3 58 36.8	980.8
21	20 51 36.18	146.05	15 50 54.4	798.5	21	22 44 33.46	137.03	3 42 16.0	981.9
22	20 54 02.23	145.82	15 37 35.9	805.0	22	22 46 50.49	136.91	3 25 54.1	982.9
23	20 56 28.05	145.60	-15 24 10.9	+811.4	23	22 49 07.40	136.79	-3 09 31.2	+983.6
Wednesday, August 14					Friday, August 16				
0	20 58 53.65	145.37	-15 10 39.5	+817.7	0	22 51 24.19	136.68	-2 53 07.6	+984.3
1	21 01 19.02	145.15	14 57 01.8	823.9	1	22 53 40.87	136.58	2 36 43.3	984.9
2	21 03 44.17	144.92	14 43 17.9	829.9	2	22 55 57.45	136.48	2 20 18.4	985.4
3	21 06 09.09	144.70	14 29 28.0	836.0	3	22 58 13.93	136.37	2 03 53.0	985.7
4	21 08 33.79	144.47	14 15 32.0	841.8	4	23 00 30.30	136.29	1 47 27.3	985.9
5	21 10 58.26	144.26	14 01 30.2	847.6	5	23 02 46.59	136.19	1 31 01.4	986.0
6	21 13 22.52	144.03	13 47 22.6	853.2	6	23 05 02.78	136.10	1 14 35.4	986.0
7	21 15 46.55	143.81	13 33 09.4	858.8	7	23 07 18.88	136.02	0 58 09.4	985.9
8	21 18 10.36	143.59	13 18 50.6	864.1	8	23 09 34.90	135.94	0 41 43.5	985.7
9	21 20 33.95	143.37	13 04 26.5	869.5	9	23 11 50.84	135.86	0 25 17.8	985.3
10	21 22 57.32	143.15	12 49 57.0	874.7	10	23 14 06.70	135.79	-0 08 52.5	984.9
11	21 25 20.47	142.94	12 35 22.3	879.7	11	23 16 22.49	135.72	+0 07 32.4	984.3
12	21 27 43.41	142.72	12 20 42.6	884.7	12	23 18 38.21	135.66	0 23 56.7	983.6
13	21 30 06.13	142.51	12 05 57.9	889.5	13	23 20 53.87	135.60	0 40 20.3	982.9
14	21 32 28.64	142.30	11 51 08.4	894.3	14	23 23 09.47	135.54	0 56 43.2	981.9
15	21 34 50.94	142.09	11 36 14.1	898.8	15	23 25 25.01	135.50	1 13 05.1	980.9
16	21 37 13.03	141.88	11 21 15.3	903.4	16	23 27 40.51	135.44	1 29 26.0	979.7
17	21 39 34.91	141.67	11 06 11.9	907.7	17	23 29 55.95	135.40	1 45 45.7	978.6
18	21 41 56.58	141.47	10 51 04.2	912.0	18	23 32 11.35	135.36	2 02 04.3	977.2
19	21 44 18.05	141.27	10 35 52.2	916.2	19	23 34 26.71	135.32	2 18 21.5	975.7
20	21 46 39.32	141.07	10 20 36.0	920.1	20	23 36 42.03	135.29	2 34 37.2	974.2
21	21 49 00.39	140.88	10 05 15.9	924.1	21	23 38 57.32	135.26	2 50 51.4	972.5
22	21 51 21.27	140.68	9 49 51.8	927.8	22	23 41 12.58	135.24	3 07 03.9	970.8
23	21 53 41.95	140.48	9 34 24.0	+931.5	23	23 43 27.82	135.21	3 23 14.7	+968.8
24	21 56 02.43		-9 18 52.5		24	23 45 43.03		+3 39 23.5	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Saturday, August 17			Monday, August 19		
0	^{h m s} 23 45 43.03 [°] 135.20	+ 3 39 23.5 [°] +966.9	0	^{h m s} 1 34 35.78 [°] 138.14	+15 25 36.2 [°] +760.3
1	23 47 58.23 [°] 135.18	3 55 30.4 [°] 964.7	1	1 36 53.92 [°] 138.26	15 38 16.5 [°] 753.9
2	23 50 13.41 [°] 135.18	4 11 35.1 [°] 962.6	2	1 39 12.18 [°] 138.38	15 50 50.4 [°] 747.6
3	23 52 28.59 [°] 135.17	4 27 37.7 [°] 960.3	3	1 41 30.56 [°] 138.50	16 03 18.0 [°] 741.1
4	23 54 43.76 [°] 135.16	4 43 38.0 [°] 957.9	4	1 43 49.06 [°] 138.62	16 15 39.1 [°] 734.6
5	23 56 58.92 [°] 135.17	4 59 35.9 [°] 955.3	5	1 46 07.68 [°] 138.75	16 27 53.7 [°] 727.9
6	23 59 14.09 [°] 135.17	5 15 31.2 [°] 952.8	6	1 48 26.43 [°] 138.86	16 40 01.6 [°] 721.3
7	0 01 29.26 [°] 135.18	5 31 24.0 [°] 950.0	7	1 50 45.29 [°] 138.99	16 52 02.9 [°] 714.6
8	0 03 44.44 [°] 135.19	5 47 14.0 [°] 947.3	8	1 53 04.28 [°] 139.11	17 03 57.5 [°] 707.8
9	0 05 59.63 [°] 135.21	6 03 01.3 [°] 944.3	9	1 55 23.39 [°] 139.23	17 15 45.3 [°] 700.9
10	0 08 14.84 [°] 135.23	6 18 45.6 [°] 941.4	10	1 57 42.62 [°] 139.36	17 27 26.2 [°] 694.0
11	0 10 30.07 [°] 135.25	6 34 27.0 [°] 938.2	11	2 00 01.98 [°] 139.48	17 39 00.2 [°] 687.0
12	0 12 45.32 [°] 135.28	6 50 05.2 [°] 935.0	12	2 02 21.46 [°] 139.61	17 50 27.2 [°] 680.0
13	0 15 00.60 [°] 135.31	7 05 40.2 [°] 931.8	13	2 04 41.07 [°] 139.73	18 01 47.2 [°] 672.8
14	0 17 15.91 [°] 135.34	7 21 12.0 [°] 928.3	14	2 07 00.80 [°] 139.85	18 13 00.0 [°] 665.7
15	0 19 31.25 [°] 135.38	7 36 40.3 [°] 924.8	15	2 09 20.65 [°] 139.99	18 24 05.7 [°] 658.4
16	0 21 46.63 [°] 135.42	7 52 05.1 [°] 921.2	16	2 11 40.64 [°] 140.10	18 35 04.1 [°] 651.2
17	0 24 02.05 [°] 135.46	8 07 26.3 [°] 917.6	17	2 14 00.74 [°] 140.23	18 45 55.3 [°] 643.8
18	0 26 17.51 [°] 135.51	8 22 43.9 [°] 913.7	18	2 16 20.97 [°] 140.36	18 56 39.1 [°] 636.5
19	0 28 33.02 [°] 135.56	8 37 57.6 [°] 909.9	19	2 18 41.33 [°] 140.47	19 07 15.6 [°] 628.9
20	0 30 48.58 [°] 135.61	8 53 07.5 [°] 905.9	20	2 21 01.80 [°] 140.60	19 17 44.5 [°] 621.5
21	0 33 04.19 [°] 135.67	9 08 13.4 [°] 901.9	21	2 23 22.40 [°] 140.72	19 28 06.0 [°] 614.0
22	0 35 19.86 [°] 135.72	9 23 15.3 [°] 897.7	22	2 25 43.12 [°] 140.84	19 38 20.0 [°] 606.3
23	0 37 35.58 [°] 135.79	+ 9 38 13.0 [°] +893.5	23	2 28 03.96 [°] 140.96	+19 48 26.3 [°] +598.6
Sunday, August 18			Tuesday, August 20		
0	0 39 51.37 [°] 135.85	+ 9 53 06.5 [°] +889.2	0	2 30 24.92 [°] 141.08	+19 58 24.9 [°] +591.0
1	0 42 07.22 [°] 135.93	10 07 55.7 [°] 884.7	1	2 32 46.00 [°] 141.20	20 08 15.9 [°] 583.1
2	0 44 23.15 [°] 135.99	10 22 40.4 [°] 880.3	2	2 35 07.20 [°] 141.31	20 17 59.0 [°] 575.4
3	0 46 39.14 [°] 136.07	10 37 20.7 [°] 875.6	3	2 37 28.51 [°] 141.44	20 27 34.4 [°] 567.5
4	0 48 55.21 [°] 136.14	10 51 56.3 [°] 870.9	4	2 39 49.95 [°] 141.54	20 37 01.9 [°] 559.5
5	0 51 11.35 [°] 136.23	11 06 27.2 [°] 866.2	5	2 42 11.49 [°] 141.66	20 46 21.4 [°] 551.7
6	0 53 27.58 [°] 136.30	11 20 53.4 [°] 861.4	6	2 44 33.15 [°] 141.77	20 55 33.1 [°] 543.6
7	0 55 43.88 [°] 136.39	11 35 14.8 [°] 856.4	7	2 46 54.92 [°] 141.87	21 04 36.7 [°] 535.6
8	0 58 00.27 [°] 136.48	11 49 31.2 [°] 851.3	8	2 49 16.79 [°] 141.99	21 13 32.3 [°] 527.5
9	1 00 16.75 [°] 136.56	12 03 42.5 [°] 846.3	9	2 51 38.78 [°] 142.09	21 22 19.8 [°] 519.4
10	1 02 33.31 [°] 136.66	12 17 48.8 [°] 841.1	10	2 54 00.87 [°] 142.19	21 30 59.2 [°] 511.3
11	1 04 49.97 [°] 136.75	12 31 49.9 [°] 835.8	11	2 56 23.06 [°] 142.29	21 39 30.5 [°] 503.0
12	1 07 06.72 [°] 136.85	12 45 45.7 [°] 830.5	12	2 58 45.35 [°] 142.39	21 47 53.5 [°] 494.8
13	1 09 23.57 [°] 136.94	12 59 36.2 [°] 825.1	13	3 01 07.74 [°] 142.49	21 56 08.3 [°] 486.5
14	1 11 40.51 [°] 137.05	13 13 21.3 [°] 819.5	14	3 03 30.23 [°] 142.58	22 04 14.8 [°] 478.2
15	1 13 57.56 [°] 137.15	13 27 00.8 [°] 813.9	15	3 05 52.81 [°] 142.68	22 12 13.0 [°] 469.9
16	1 16 14.71 [°] 137.25	13 40 34.7 [°] 808.3	16	3 08 15.49 [°] 142.76	22 20 02.9 [°] 461.4
17	1 18 31.96 [°] 137.36	13 54 03.0 [°] 802.6	17	3 10 38.25 [°] 142.85	22 27 44.3 [°] 453.1
18	1 20 49.32 [°] 137.46	14 07 25.6 [°] 796.7	18	3 13 01.10 [°] 142.93	22 35 17.4 [°] 444.6
19	1 23 06.78 [°] 137.58	14 20 42.3 [°] 790.9	19	3 15 24.03 [°] 143.01	22 42 42.0 [°] 436.1
20	1 25 24.36 [°] 137.68	14 33 53.2 [°] 784.9	20	3 17 47.04 [°] 143.09	22 49 58.1 [°] 427.6
21	1 27 42.04 [°] 137.80	14 46 58.1 [°] 778.8	21	3 20 10.13 [°] 143.16	22 57 05.7 [°] 419.0
22	1 29 59.84 [°] 137.91	14 59 56.9 [°] 772.8	22	3 22 33.29 [°] 143.24	23 04 04.7 [°] 410.5
23	1 32 17.75 [°] 138.03	15 12 49.7 [°] +766.5	23	3 24 56.53 [°] 143.30	23 10 55.2 [°] +401.9
24	1 34 35.78 [°]	+15 25 36.2 [°]	24	3 27 19.83 [°]	+23 17 37.1 [°]

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Wednesday, August 21							Friday, August 23						
0	3 ^h 27 ^m 19 ^s .83	143.37	+23° 17' 37".1	+393.3			0	5 ^h 21 ^m 58 ^s .88	141.46	+25° 46' 37".8	-28.5		
1	3 29 43.20	143.43	23 24 10.4	384.6			1	5 24 20.34	141.30	25 46 09.3	37.1		
2	3 32 06.63	143.49	23 30 35.0	375.9			2	5 26 41.64	141.15	25 45 32.2	45.5		
3	3 34 30.12	143.54	23 36 50.9	367.3			3	5 29 02.79	140.98	25 44 46.7	53.9		
4	3 36 53.66	143.59	23 42 58.2	358.5			4	5 31 23.77	140.81	25 43 52.8	62.4		
5	3 39 17.25	143.64	23 48 56.7	349.8			5	5 33 44.58	140.65	25 42 50.4	70.7		
6	3 41 40.89	143.69	23 54 46.5	341.1			6	5 36 05.23	140.47	25 41 39.7	79.0		
7	3 44 04.58	143.72	24 00 27.6	332.3			7	5 38 25.70	140.28	25 40 20.7	87.4		
8	3 46 28.30	143.76	24 05 59.9	323.5			8	5 40 45.98	140.11	25 38 53.3	95.6		
9	3 48 52.06	143.79	24 11 23.4	314.7			9	5 43 06.09	139.91	25 37 17.7	103.9		
10	3 51 15.85	143.82	24 16 38.1	305.9			10	5 45 26.00	139.73	25 35 33.8	112.1		
11	3 53 39.67	143.84	24 21 44.0	297.1			11	5 47 45.73	139.52	25 33 41.7	120.3		
12	3 56 03.51	143.86	24 26 41.1	288.2			12	5 50 05.25	139.33	25 31 41.4	128.4		
13	3 58 27.37	143.88	24 31 29.3	279.4			13	5 52 24.58	139.12	25 29 33.0	136.5		
14	4 00 51.25	143.88	24 36 08.7	270.5			14	5 54 43.70	138.91	25 27 16.5	144.5		
15	4 03 15.13	143.89	24 40 39.2	261.6			15	5 57 02.61	138.70	25 24 52.0	152.6		
16	4 05 39.02	143.90	24 45 00.8	252.8			16	5 59 21.31	138.48	25 22 19.4	160.5		
17	4 08 02.92	143.89	24 49 13.6	243.9			17	6 01 39.79	138.27	25 19 38.9	168.5		
18	4 10 26.81	143.88	24 53 17.5	235.0			18	6 03 58.06	138.04	25 16 50.4	176.4		
19	4 12 50.69	143.87	24 57 12.5	226.1			19	6 06 16.10	137.82	25 13 54.0	184.2		
20	4 15 14.56	143.86	25 00 58.6	217.2			20	6 08 33.92	137.59	25 10 49.8	192.0		
21	4 17 38.42	143.83	25 04 35.8	208.3			21	6 10 51.51	137.36	25 07 37.8	199.7		
22	4 20 02.25	143.80	25 08 04.1	199.4			22	6 13 08.87	137.12	25 04 18.1	207.5		
23	4 22 26.05	143.78	+25 11 23.5	+190.5			23	6 15 25.99	136.88	+25 00 50.6	-215.1		
Thursday, August 22							Saturday, August 24						
0	4 24 49.83	143.74	+25 14 34.0	+181.6			0	6 17 42.87	136.64	+24 57 15.5	-222.8		
1	4 27 13.57	143.70	25 17 35.6	172.7			1	6 19 59.51	136.39	24 53 32.7	230.3		
2	4 29 37.27	143.66	25 20 28.3	163.9			2	6 22 15.90	136.15	24 49 42.4	237.9		
3	4 32 00.93	143.61	25 23 12.2	154.9			3	6 24 32.05	135.90	24 45 44.5	245.3		
4	4 34 24.54	143.55	25 25 47.1	146.0			4	6 26 47.95	135.64	24 41 39.2	252.8		
5	4 36 48.09	143.50	25 28 13.1	137.2			5	6 29 03.59	135.39	24 37 26.4	260.2		
6	4 39 11.59	143.43	25 30 30.3	128.4			6	6 31 18.98	135.13	24 33 06.2	267.5		
7	4 41 35.02	143.36	25 32 38.7	119.5			7	6 33 34.11	134.88	24 28 38.7	274.8		
8	4 43 58.38	143.29	25 34 38.2	110.6			8	6 35 48.99	134.61	24 24 03.9	282.0		
9	4 46 21.67	143.21	25 36 28.8	101.8			9	6 38 03.60	134.34	24 19 21.9	289.3		
10	4 48 44.88	143.12	25 38 10.6	93.0			10	6 40 17.94	134.08	24 14 32.6	296.3		
11	4 51 08.00	143.04	25 39 43.6	84.2			11	6 42 32.02	133.80	24 09 36.3	303.5		
12	4 53 31.04	142.95	25 41 07.8	75.4			12	6 44 45.82	133.53	24 04 32.8	310.5		
13	4 55 53.99	142.84	25 42 23.2	66.6			13	6 46 59.35	133.26	23 59 22.3	317.4		
14	4 58 16.83	142.75	25 43 29.8	57.9			14	6 49 12.61	132.99	23 54 04.9	324.4		
15	5 00 39.58	142.64	25 44 27.7	49.1			15	6 51 25.60	132.71	23 48 40.5	331.3		
16	5 03 02.22	142.52	25 45 16.8	40.4			16	6 53 38.31	132.43	23 43 09.2	338.1		
17	5 05 24.74	142.41	25 45 57.2	31.7			17	6 55 50.74	132.15	23 37 31.1	344.9		
18	5 07 47.15	142.28	25 46 28.9	23.1			18	6 58 02.89	131.87	23 31 46.2	351.6		
19	5 10 09.43	142.16	25 46 52.0	14.4			19	7 00 14.76	131.59	23 25 54.6	358.2		
20	5 12 31.59	142.03	25 47 06.4	5.7			20	7 02 26.35	131.30	23 19 56.4	364.9		
21	5 14 53.62	141.90	25 47 12.1	-2.8			21	7 04 37.65	131.02	23 13 51.5	371.4		
22	5 17 15.52	141.75	25 47 09.3	-11.5			22	7 06 48.67	130.74	23 07 40.1	377.9		
23	5 19 37.27	141.61	25 46 57.8	-20.0			23	7 08 59.41	130.44	23 01 22.2	-384.3		
24	5 21 58.88		+25 46 37.8				24	7 11 09.85		+22 54 57.9			

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Sunday, August 25			Tuesday, August 27		
0	^{h m s} 7 11 09.85	^{° ' "} +22 54 57.9	0	^{h m s} 8 49 53.90	^{° ' "} +15 59 34.0
1	7 13 20.01	22 48 27.2	1	8 51 50.66	15 49 02.8
2	7 15 29.88	22 41 50.1	2	8 53 47.18	15 38 27.9
3	7 17 39.46	22 35 06.7	3	8 55 43.45	15 27 49.5
4	7 19 48.74	22 28 17.2	4	8 57 39.49	15 17 07.5
5	7 21 57.74	22 21 21.4	5	8 59 35.29	15 06 22.0
6	7 24 06.45	22 14 19.6	6	9 01 30.85	14 55 33.1
7	7 26 14.86	22 07 11.7	7	9 03 26.18	14 44 40.8
8	7 28 22.99	21 59 57.8	8	9 05 21.29	14 33 45.1
9	7 30 30.82	21 52 38.0	9	9 07 16.16	14 22 46.2
10	7 32 38.36	21 45 12.3	10	9 09 10.81	14 11 44.1
11	7 34 45.61	21 37 40.7	11	9 11 05.24	14 00 38.8
12	7 36 52.56	21 30 03.4	12	9 12 59.45	13 49 30.3
13	7 38 59.22	21 22 20.4	13	9 14 53.44	13 38 18.8
14	7 41 05.59	21 14 31.7	14	9 16 47.22	13 27 04.2
15	7 43 11.67	21 06 37.4	15	9 18 40.79	13 15 46.7
16	7 45 17.45	20 58 37.6	16	9 20 34.14	13 04 26.2
17	7 47 22.95	20 50 32.3	17	9 22 27.29	12 53 02.9
18	7 49 28.15	20 42 21.5	18	9 24 20.24	12 41 36.8
19	7 51 33.06	20 34 05.4	19	9 26 12.99	12 30 07.9
20	7 53 37.69	20 25 43.9	20	9 28 05.54	12 18 36.3
21	7 55 42.02	20 17 17.2	21	9 29 57.89	12 07 02.0
22	7 57 46.06	20 08 45.3	22	9 31 50.06	11 55 25.0
23	7 59 49.82	+20 00 08.2	23	9 33 42.03	+11 43 45.5
	123.47	-522.1		111.79	-702.0
Monday, August 26			Wednesday, August 28		
0	8 01 53.29	+19 51 26.1	0	9 35 33.82	+11 32 03.5
1	8 03 56.48	19 42 38.9	1	9 37 25.43	11 20 19.0
2	8 05 59.38	19 33 46.8	2	9 39 16.85	11 08 32.1
3	8 08 01.99	19 24 49.7	3	9 41 08.10	10 56 42.8
4	8 10 04.33	19 15 47.8	4	9 42 59.18	10 44 51.2
5	8 12 06.38	19 06 41.0	5	9 44 50.08	10 32 57.3
6	8 14 08.15	18 57 29.6	6	9 46 40.82	10 21 01.2
7	8 16 09.64	18 48 13.4	7	9 48 31.39	10 09 03.0
8	8 18 10.86	18 38 52.6	8	9 50 21.79	9 57 02.6
9	8 20 11.80	18 29 27.2	9	9 52 12.04	9 45 00.1
10	8 22 12.46	18 19 57.2	10	9 54 02.13	9 32 55.5
11	8 24 12.85	18 10 22.8	11	9 55 52.07	9 20 49.0
12	8 26 12.97	18 00 44.0	12	9 57 41.86	9 08 40.5
13	8 28 12.82	17 51 00.8	13	9 59 31.50	8 56 30.1
14	8 30 12.41	17 41 13.3	14	10 01 21.00	8 44 17.9
15	8 32 11.72	17 31 21.6	15	10 03 10.36	8 32 03.9
16	8 34 10.77	17 21 25.7	16	10 04 59.58	8 19 48.2
17	8 36 09.56	17 11 25.6	17	10 06 48.67	8 07 30.7
18	8 38 08.09	17 01 21.5	18	10 08 37.63	7 55 11.5
19	8 40 06.36	16 51 13.3	19	10 10 26.46	7 42 50.8
20	8 42 04.37	16 41 01.2	20	10 12 15.17	7 30 28.4
21	8 44 02.13	16 30 45.1	21	10 14 03.75	7 18 04.6
22	8 45 59.64	16 20 25.2	22	10 15 52.22	7 05 39.2
23	8 47 56.89	16 10 01.5	23	10 17 40.57	6 53 12.5
24	8 49 53.90	+15 59 34.0	24	10 19 28.81	+6 40 44.3
		-627.5			-748.2

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Thursday, August 29			Saturday, August 31		
0	^h 10 ^m 19 ^s 28.81 [°] 108.13	+ 6 40 44.3 -749.5	0	^h 11 ^m 44 ^s 59.83 [°] 106.96	- 3 30 41.3 -762.9
1	10 21 16.94 [°] 108.03	6 28 14.8 -750.8	1	11 46 46.79 [°] 107.01	3 43 24.2 -762.1
2	10 23 04.97 [°] 107.93	6 15 44.0 -752.1	2	11 48 33.80 [°] 107.09	3 56 06.3 -761.3
3	10 24 52.90 [°] 107.83	6 03 11.9 -753.2	3	11 50 20.89 [°] 107.15	4 08 47.6 -760.4
4	10 26 40.73 [°] 107.73	5 50 38.7 -754.5	4	11 52 08.04 [°] 107.22	4 21 28.0 -759.6
5	10 28 28.46 [°] 107.65	5 38 04.2 -755.5	5	11 53 55.26 [°] 107.20	4 34 07.6 -758.7
6	10 30 16.11 [°] 107.55	5 25 28.7 -756.7	6	11 55 42.55 [°] 107.38	4 46 46.3 -757.6
7	10 32 03.66 [°] 107.47	5 12 52.0 -757.6	7	11 57 29.93 [°] 107.45	4 59 23.9 -756.7
8	10 33 51.13 [°] 107.39	5 00 14.4 -758.6	8	11 59 17.38 [°] 107.54	5 12 00.6 -755.6
9	10 35 38.52 [°] 107.31	4 47 35.8 -759.6	9	12 01 04.92 [°] 107.63	5 24 36.2 -754.4
10	10 37 25.83 [°] 107.24	4 34 56.2 -760.5	10	12 02 52.55 [°] 107.72	5 37 10.6 -753.4
11	10 39 13.07 [°] 107.17	4 22 15.7 -761.4	11	12 04 40.27 [°] 107.82	5 49 44.0 -752.1
12	10 41 00.24 [°] 107.10	4 09 34.3 -762.1	12	12 06 28.09 [°] 107.92	6 02 16.1 -750.9
13	10 42 47.34 [°] 107.03	3 56 52.2 -763.0	13	12 08 16.01 [°] 108.01	6 14 47.0 -749.6
14	10 44 34.37 [°] 106.98	3 44 09.2 -763.6	14	12 10 04.02 [°] 108.13	6 27 16.6 -748.3
15	10 46 21.35 [°] 106.91	3 31 25.6 -764.3	15	12 11 52.15 [°] 108.24	6 39 44.9 -746.9
16	10 48 08.26 [°] 106.86	3 18 41.3 -765.0	16	12 13 40.39 [°] 108.34	6 52 11.8 -745.6
17	10 49 55.12 [°] 106.82	3 05 56.3 -765.6	17	12 15 28.73 [°] 108.47	7 04 37.4 -744.0
18	10 51 41.94 [°] 106.76	2 53 10.7 -766.1	18	12 17 17.20 [°] 108.58	7 17 01.4 -742.6
19	10 53 28.70 [°] 106.72	2 40 24.6 -766.6	19	12 19 05.78 [°] 108.71	7 29 24.0 -741.0
20	10 55 15.42 [°] 106.68	2 27 38.0 -767.1	20	12 20 54.49 [°] 108.84	7 41 45.0 -739.5
21	10 57 02.10 [°] 106.64	2 14 50.9 -767.5	21	12 22 43.33 [°] 108.96	7 54 04.5 -737.8
22	10 58 48.74 [°] 106.61	2 02 03.4 -767.9	22	12 24 32.29 [°] 109.10	8 06 22.3 -736.2
23	11 00 35.35 [°] 106.58	+ 1 49 15.5 -768.2	23	12 26 21.39 [°] 109.24	- 8 18 38.5 -734.4
Friday, August 30			Sunday, September 1		
0	11 02 21.93 [°] 106.55	+ 1 36 27.3 -768.5	0	12 28 10.63 [°] 109.38	- 8 30 52.9 -732.7
1	11 04 08.48 [°] 106.53	1 23 38.8 -768.8	1	12 30 00.01 [°] 109.52	8 43 05.6 -730.8
2	11 05 55.01 [°] 106.51	1 10 50.0 -769.0	2	12 31 49.53 [°] 109.67	8 55 16.4 -729.0
3	11 07 41.52 [°] 106.50	0 58 01.0 -769.2	3	12 33 39.20 [°] 109.82	9 07 25.4 -727.1
4	11 09 28.02 [°] 106.48	0 45 11.8 -769.3	4	12 35 29.02 [°] 109.98	9 19 32.5 -725.2
5	11 11 14.50 [°] 106.47	0 32 22.5 -769.3	5	12 37 19.00 [°] 110.13	9 31 37.7 -723.2
6	11 13 00.97 [°] 106.46	0 19 33.2 -769.5	6	12 39 09.13 [°] 110.29	9 43 40.9 -721.1
7	11 14 47.43 [°] 106.46	+ 0 06 43.7 -769.4	7	12 40 59.42 [°] 110.46	9 55 42.0 -719.1
8	11 16 33.89 [°] 106.47	- 0 06 05.7 -769.4	8	12 42 49.88 [°] 110.63	10 07 41.1 -716.9
9	11 18 20.36 [°] 106.47	0 18 55.1 -769.3	9	12 44 40.51 [°] 110.80	10 19 38.0 -714.8
10	11 20 06.83 [°] 106.47	0 31 44.4 -769.1	10	12 46 31.31 [°] 110.98	10 31 32.8 -712.5
11	11 21 53.30 [°] 106.49	0 44 33.5 -769.0	11	12 48 22.29 [°] 111.15	10 43 25.3 -710.3
12	11 23 39.79 [°] 106.50	0 57 22.5 -768.7	12	12 50 13.44 [°] 111.33	10 55 15.6 -707.9
13	11 25 26.29 [°] 106.53	1 10 11.2 -768.5	13	12 52 04.77 [°] 111.52	11 07 03.5 -705.6
14	11 27 12.82 [°] 106.54	1 22 59.7 -768.2	14	12 53 56.29 [°] 111.71	11 18 49.1 -703.2
15	11 28 59.36 [°] 106.57	1 35 47.9 -767.9	15	12 55 48.00 [°] 111.90	11 30 32.3 -700.8
16	11 30 45.93 [°] 106.60	1 48 35.8 -767.5	16	12 57 39.90 [°] 112.10	11 42 13.1 -698.2
17	11 32 32.53 [°] 106.63	2 01 23.3 -767.0	17	12 59 32.00 [°] 112.29	11 53 51.3 -695.7
18	11 34 19.16 [°] 106.67	2 14 10.3 -766.6	18	13 01 24.29 [°] 112.50	12 05 27.0 -693.1
19	11 36 05.83 [°] 106.71	2 26 56.9 -766.1	19	13 03 16.79 [°] 112.69	12 17 00.1 -690.5
20	11 37 52.54 [°] 106.75	2 39 43.0 -765.5	20	13 05 09.48 [°] 112.91	12 28 30.6 -687.8
21	11 39 39.29 [°] 106.79	2 52 28.5 -764.9	21	13 07 02.39 [°] 113.12	12 39 58.4 -685.0
22	11 41 26.08 [°] 106.85	3 05 13.4 -764.3	22	13 08 55.51 [°] 113.33	12 51 23.4 -682.2
23	11 43 12.93 [°] 106.90	3 17 57.7 -763.6	23	13 10 48.84 [°] 113.55	13 02 45.6 -679.4
24	11 44 59.83 [°] 106.90	- 3 30 41.3 -763.4	24	13 12 42.39 [°] 113.55	-13 14 05.0 -679.4

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Monday, September 2							Wednesday, September 4						
0	13 ^h 12 ^m 42 ^s ·39	113·77	—13° 14' 05·0	—676·5			0	14 ^h 48 ^m 43 ^s ·80	127·46	—21° 04' 51·3	—474·8		
1	13 14 36·16	113·99	13 25 21·5	673·5			1	14 50 51·26	127·78	21 12 46·1	469·2		
2	13 16 30·15	114·22	13 36 35·0	670·6			2	14 52 59·04	128·12	21 20 35·3	463·5		
3	13 18 24·37	114·46	13 47 45·6	667·6			3	14 55 07·16	128·46	21 28 18·8	457·8		
4	13 20 18·83	114·68	13 58 53·2	664·4			4	14 57 15·62	128·78	21 35 56·6	452·0		
5	13 22 13·51	114·92	14 09 57·6	661·3			5	14 59 24·40	129·12	21 43 28·6	446·1		
6	13 24 08·43	115·16	14 20 58·9	658·2			6	15 01 33·52	129·46	21 50 54·7	440·2		
7	13 26 03·59	115·40	14 31 57·1	654·8			7	15 03 42·98	129·79	21 58 14·9	434·2		
8	13 27 58·99	115·65	14 42 51·9	651·6			8	15 05 52·77	130·12	22 05 29·1	428·2		
9	13 29 54·64	115·89	14 53 43·5	648·3			9	15 08 02·89	130·45	22 12 37·3	422·0		
10	13 31 50·53	116·14	15 04 31·8	644·8			10	15 10 13·34	130·79	22 19 39·3	415·9		
11	13 33 46·67	116·40	15 15 16·6	641·4			11	15 12 24·13	131·13	22 26 35·2	409·7		
12	13 35 43·07	116·65	15 25 58·0	637·9			12	15 14 35·26	131·46	22 33 24·9	403·4		
13	13 37 39·72	116·92	15 36 35·9	634·3			13	15 16 46·72	131·80	22 40 08·3	397·0		
14	13 39 36·64	117·18	15 47 10·2	630·8			14	15 18 58·52	132·13	22 46 45·3	390·5		
15	13 41 33·82	117·44	15 57 41·0	627·1			15	15 21 10·65	132·47	22 53 15·8	384·1		
16	13 43 31·26	117·71	16 08 08·1	623·3			16	15 23 23·12	132·80	22 59 39·9	377·6		
17	13 45 28·97	117·98	16 18 31·4	619·7			17	15 25 35·92	133·14	23 05 57·5	370·9		
18	13 47 26·95	118·26	16 28 51·1	615·8			18	15 27 49·06	133·46	23 12 08·4	364·3		
19	13 49 25·21	118·53	16 39 06·9	611·9			19	15 30 02·52	133·80	23 18 12·7	357·5		
20	13 51 23·74	118·81	16 49 18·8	608·0			20	15 32 16·32	134·14	23 24 10·2	350·8		
21	13 53 22·55	119·09	16 59 26·8	604·0			21	15 34 30·46	134·46	23 30 01·0	343·9		
22	13 55 21·64	119·37	17 09 30·8	599·9			22	15 36 44·92	134·79	23 35 44·9	337·0		
23	13 57 21·01	119·66	—17 19 30·7	—595·9			23	15 38 59·71	135·12	—23 41 21·9	—330·0		
Tuesday, September 3							Thursday, September 5						
0	13 59 20·67	119·95	—17 29 26·6	—591·7			0	15 41 14·83	135·45	—23 46 51·9	—323·0		
1	14 01 20·62	120·23	17 39 18·3	587·5			1	15 43 30·28	135·77	23 52 14·9	315·8		
2	14 03 20·85	120·53	17 49 05·8	583·3			2	15 45 46·05	136·09	23 57 30·7	308·7		
3	14 05 21·38	120·83	17 58 49·1	578·9			3	15 48 02·14	136·42	24 02 39·4	301·5		
4	14 07 22·21	121·12	18 08 28·0	574·6			4	15 50 18·56	136·75	24 07 40·9	294·3		
5	14 09 23·33	121·43	18 18 02·6	570·1			5	15 52 35·31	137·06	24 12 35·2	286·8		
6	14 11 24·76	121·72	18 27 32·7	565·7			6	15 54 52·37	137·38	24 17 22·0	279·5		
7	14 13 26·48	122·03	18 36 58·4	561·1			7	15 57 09·75	137·69	24 22 01·5	272·0		
8	14 15 28·51	122·34	18 46 19·5	556·5			8	15 59 27·44	138·00	24 26 33·5	264·5		
9	14 17 30·85	122·64	18 55 36·0	551·8			9	16 01 45·44	138·32	24 30 58·0	257·0		
10	14 19 33·49	122·96	19 04 47·8	547·2			10	16 04 03·76	138·63	24 35 15·0	249·2		
11	14 21 36·45	123·26	19 13 55·0	542·3			11	16 06 22·39	138·93	24 39 24·2	241·6		
12	14 23 39·71	123·58	19 22 57·3	537·5			12	16 08 41·32	139·24	24 43 25·8	233·8		
13	14 25 43·29	123·89	19 31 54·8	532·6			13	16 11 00·56	139·54	24 47 19·6	226·0		
14	14 27 47·18	124·21	19 40 47·4	527·7			14	16 13 20·10	139·83	24 51 05·6	218·2		
15	14 29 51·39	124·53	19 49 35·1	522·7			15	16 15 39·93	140·14	24 54 43·8	210·2		
16	14 31 55·92	124·85	19 58 17·8	517·5			16	16 18 00·07	140·42	24 58 14·0	202·3		
17	14 34 00·77	125·17	20 06 55·3	512·5			17	16 20 20·49	140·72	25 01 36·3	194·2		
18	14 36 05·94	125·50	20 15 27·8	507·3			18	16 22 41·21	141·00	25 04 50·5	186·1		
19	14 38 11·44	125·82	20 23 55·1	502·0			19	16 25 02·21	141·29	25 07 56·6	178·0		
20	14 40 17·26	126·14	20 32 17·1	496·7			20	16 27 23·50	141·56	25 10 54·6	169·8		
21	14 42 23·40	126·47	20 40 33·8	491·3			21	16 29 45·06	141·84	25 13 44·4	161·6		
22	14 44 29·87	126·80	20 48 45·1	485·8			22	16 32 06·90	142·12	25 16 26·0	153·2		
23	14 46 36·67	127·13	20 56 50·9	480·4			23	16 34 29·02	142·38	25 18 59·2	144·9		
24	14 48 43·80		—21 04 51·3				24	16 36 51·40		—25 21 24·1			

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Friday, September 6			Sunday, September 8		
0	^h 16 ^m 36 ^s 51.40 ^s 142.65	-25 21 24.1 -136.5	0	^h 18 ^m 34 ^s 30.20 ^s 149.54	-24 20 35.6 +307.2
1	16 39 14.05 142.91	25 23 40.6 128.0	1	18 36 59.74 149.54	24 15 28.4 316.7
2	16 41 36.96 143.17	25 25 48.6 119.5	2	18 39 29.28 149.55	24 10 11.7 326.4
3	16 44 00.13 143.42	25 27 48.1 111.0	3	18 41 58.83 149.54	24 04 45.3 335.8
4	16 46 23.55 143.67	25 29 39.1 102.4	4	18 44 28.37 149.54	23 59 09.5 345.4
5	16 48 47.22 143.92	25 31 21.5 93.7	5	18 46 57.91 149.52	23 53 24.1 354.9
6	16 51 11.14 144.16	25 32 55.2 85.1	6	18 49 27.43 149.50	23 47 29.2 364.4
7	16 53 35.30 144.39	25 34 20.3 76.3	7	18 51 56.93 149.48	23 41 24.8 373.8
8	16 55 59.69 144.62	25 35 36.6 67.5	8	18 54 26.41 149.45	23 35 11.0 383.3
9	16 58 24.31 144.85	25 36 44.1 58.7	9	18 56 55.86 149.41	23 28 47.7 392.8
10	17 00 49.16 145.08	25 37 42.8 49.8	10	18 59 25.27 149.37	23 22 14.9 402.1
11	17 03 14.24 145.29	25 38 32.6 40.9	11	19 01 54.64 149.33	23 15 32.8 411.6
12	17 05 39.53 145.50	25 39 13.5 32.0	12	19 04 23.97 149.28	23 08 41.2 420.9
13	17 08 05.03 145.72	25 39 45.5 22.9	13	19 06 53.25 149.23	23 01 40.3 430.3
14	17 10 30.75 145.91	25 40 08.4 14.0	14	19 09 22.48 149.17	22 54 30.0 439.5
15	17 12 56.66 146.12	25 40 22.4 4.8	15	19 11 51.65 149.11	22 47 10.5 448.8
16	17 15 22.78 146.30	25 40 27.2 + 4.2	16	19 14 20.76 149.03	22 39 41.7 458.1
17	17 17 49.08 146.50	25 40 23.0 13.4	17	19 16 49.79 148.97	22 32 03.6 467.2
18	17 20 15.58 146.68	25 40 09.6 22.5	18	19 19 18.76 148.89	22 24 16.4 476.5
19	17 22 42.26 146.85	25 39 47.1 31.8	19	19 21 47.65 148.82	22 16 19.9 485.5
20	17 25 09.11 147.03	25 39 15.3 41.0	20	19 24 16.47 148.73	22 08 14.4 494.6
21	17 27 36.14 147.19	25 38 34.3 50.2	21	19 26 45.20 148.64	21 59 59.8 503.6
22	17 30 03.33 147.35	25 37 44.1 59.5	22	19 29 13.84 148.55	21 51 36.2 512.7
23	17 32 30.68 147.51	-25 36 44.6 + 68.9	23	19 31 42.39 148.45	-21 43 03.5 +521.6
Saturday, September 7			Monday, September 9		
0	17 34 58.19 147.66	-25 35 35.7 + 78.2	0	19 34 10.84 148.36	-21 34 21.9 +530.5
1	17 37 25.85 147.80	25 34 17.5 87.6	1	19 36 39.20 148.25	21 25 31.4 539.4
2	17 39 53.65 147.94	25 32 49.9 97.0	2	19 39 07.45 148.14	21 16 32.0 548.2
3	17 42 21.59 148.08	25 31 12.9 106.5	3	19 41 35.59 148.04	21 07 23.8 557.0
4	17 44 49.67 148.20	25 29 26.4 115.9	4	19 44 03.63 147.92	20 58 06.8 565.7
5	17 47 17.87 148.32	25 27 30.5 125.3	5	19 46 31.55 147.81	20 48 41.1 574.4
6	17 49 46.19 148.44	25 25 25.2 134.8	6	19 48 59.36 147.70	20 39 06.7 582.9
7	17 52 14.63 148.55	25 23 10.4 144.4	7	19 51 27.06 147.57	20 29 23.8 591.5
8	17 54 43.18 148.66	25 20 46.0 153.8	8	19 53 54.63 147.45	20 19 32.3 600.0
9	17 57 11.84 148.75	25 18 12.2 163.4	9	19 56 22.08 147.32	20 09 32.3 608.4
10	17 59 40.59 148.84	25 15 28.8 172.9	10	19 58 49.40 147.19	19 59 23.9 616.8
11	18 02 09.43 148.93	25 12 35.9 182.5	11	20 01 16.59 147.06	19 49 07.1 625.1
12	18 04 38.36 149.01	25 09 33.4 192.1	12	20 03 43.65 146.93	19 38 42.0 633.3
13	18 07 07.37 149.09	25 06 21.3 201.6	13	20 06 10.58 146.79	19 28 08.7 641.6
14	18 09 36.46 149.16	25 02 59.7 211.2	14	20 08 37.37 146.65	19 17 27.1 649.6
15	18 12 05.62 149.22	24 59 28.5 220.9	15	20 11 04.02 146.51	19 06 37.5 657.7
16	18 14 34.84 149.27	24 55 47.6 230.4	16	20 13 30.53 146.37	18 55 39.8 665.7
17	18 17 04.11 149.33	24 51 57.2 240.0	17	20 15 56.90 146.23	18 44 34.1 673.6
18	18 19 33.44 149.38	24 47 57.2 249.6	18	20 18 23.13 146.09	18 33 20.5 681.4
19	18 22 02.82 149.42	24 43 47.6 259.2	19	20 20 49.22 145.94	18 21 59.1 689.2
20	18 24 32.24 149.45	24 39 28.4 268.8	20	20 23 15.16 145.79	18 10 29.9 696.8
21	18 27 01.69 149.48	24 34 59.6 278.4	21	20 25 40.95 145.64	17 58 53.1 704.5
22	18 29 31.17 149.50	24 30 21.2 288.0	22	20 28 06.59 145.50	17 47 08.6 712.0
23	18 32 00.67 149.53	24 25 33.2 +297.6	23	20 30 32.09 145.34	17 35 16.6 +719.5
24	18 34 30.20	-24 20 35.6	24	20 32 57.43	-17 23 17.1

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Tuesday, September 10			Thursday, September 12		
0	^{h m s} 20 32 57.43 145-19	^{° ' "} -17 23 17.1 +726.9	0	^{h m s} 22 26 24.10 138-89	^{° ' "} - 5 51 23.4 +968.3
1	20 35 22.62 145-04	17 11 10.2 734.1	1	22 28 42.99 138-82	5 35 15.1 970.7
2	20 37 47.66 144-89	16 58 56.1 741.4	2	22 31 01.81 138-74	5 19 04.4 972.9
3	20 40 12.55 144-73	16 46 34.7 748.5	3	22 33 20.55 138-66	5 02 51.5 975.0
4	20 42 37.28 144-58	16 34 06.2 755.6	4	22 35 39.21 138-60	4 46 36.5 977.1
5	20 45 01.86 144-42	16 21 30.6 762.5	5	22 37 57.81 138-54	4 30 19.4 978.9
6	20 47 26.28 144-27	16 08 48.1 769.4	6	22 40 16.35 138-48	4 14 00.5 980.7
7	20 49 50.55 144-12	15 55 58.7 776.2	7	22 42 34.83 138-41	3 57 39.8 982.3
8	20 52 14.67 143-96	15 43 02.5 782.9	8	22 44 53.24 138-37	3 41 17.5 983.9
9	20 54 38.63 143-81	15 29 59.6 789.5	9	22 47 11.61 138-31	3 24 53.6 985.3
10	20 57 02.44 143-66	15 16 50.1 796.0	10	22 49 29.92 138-26	3 08 28.3 986.6
11	20 59 26.10 143-50	15 03 34.1 802.5	11	22 51 48.18 138-21	2 52 01.7 987.7
12	21 01 49.60 143-35	14 50 11.6 808.8	12	22 54 06.39 138-17	2 35 34.0 988.8
13	21 04 12.95 143-20	14 36 42.8 815.1	13	22 56 24.56 138-14	2 19 05.2 989.7
14	21 06 36.15 143-04	14 23 07.7 821.2	14	22 58 42.70 138-10	2 02 35.5 990.5
15	21 08 59.19 142-90	14 09 26.5 827.3	15	23 01 00.80 138-07	1 46 05.0 991.2
16	21 11 22.09 142-74	13 55 39.2 833.2	16	23 03 18.87 138-05	1 29 33.8 991.8
17	21 13 44.83 142-59	13 41 46.0 839.1	17	23 05 36.92 138-01	1 13 02.0 992.2
18	21 16 07.42 142-45	13 27 46.9 844.9	18	23 07 54.93 138-00	0 56 29.8 992.6
19	21 18 29.87 142-30	13 13 42.0 850.5	19	23 10 12.93 137-98	0 39 57.2 992.7
20	21 20 52.17 142-15	12 59 31.5 856.1	20	23 12 30.91 137-97	0 23 24.5 992.9
21	21 23 14.32 142-01	12 45 15.4 861.6	21	23 14 48.88 137-96	- 0 06 51.6 992.8
22	21 25 36.33 141-87	12 30 53.8 866.9	22	23 17 06.84 137-95	+ 0 09 41.2 992.6
23	21 27 58.20 141-72	-12 16 26.9 +872.2	23	23 19 24.79 137-95	+ 0 26 13.8 +992.4
Wednesday, September 11			Friday, September 13		
0	21 30 19.92 141-59	-12 01 54.7 +877.4	0	23 21 42.74 137-95	+ 0 42 46.2 +992.0
1	21 32 41.51 141-44	11 47 17.3 882.4	1	23 24 00.69 137-96	0 59 18.2 991.4
2	21 35 02.95 141-31	11 32 34.9 887.3	2	23 26 18.65 137-96	1 15 49.6 990.8
3	21 37 24.26 141-18	11 17 47.6 892.2	3	23 28 36.61 137-97	1 32 20.4 990.1
4	21 39 45.44 141-04	11 02 55.4 897.0	4	23 30 54.58 137-99	1 48 50.5 989.2
5	21 42 06.48 140-91	10 47 58.4 901.5	5	23 33 12.57 138-00	2 05 19.7 988.1
6	21 44 27.39 140-78	10 32 56.9 906.1	6	23 35 30.57 138-03	2 21 47.8 987.1
7	21 46 48.17 140-66	10 17 50.8 910.5	7	23 37 48.60 138-05	2 38 14.9 985.8
8	21 49 08.83 140-53	10 02 40.3 914.8	8	23 40 06.65 138-08	2 54 40.7 984.4
9	21 51 29.36 140-41	9 47 25.5 919.0	9	23 42 24.73 138-12	3 11 05.1 983.0
10	21 53 49.77 140-29	9 32 06.5 923.0	10	23 44 42.85 138-14	3 27 28.1 981.4
11	21 56 10.06 140-17	9 16 43.5 927.1	11	23 47 00.99 138-19	3 43 49.5 979.7
12	21 58 30.23 140-06	9 01 16.4 930.9	12	23 49 19.18 138-23	4 00 09.2 977.9
13	22 00 50.29 139-94	8 45 45.5 934.6	13	23 51 37.41 138-27	4 16 27.1 975.9
14	22 03 10.23 139-84	8 30 10.9 938.3	14	23 53 55.68 138-32	4 32 43.0 973.8
15	22 05 30.07 139-73	8 14 32.6 941.8	15	23 56 14.00 138-38	4 48 56.8 971.6
16	22 07 49.80 139-62	7 58 50.8 945.2	16	23 58 32.38 138-42	5 05 08.4 969.4
17	22 10 09.42 139-52	7 43 05.6 948.5	17	0 00 50.80 138-49	5 21 17.8 966.9
18	22 12 28.94 139-42	7 27 17.1 951.7	18	0 03 09.29 138-55	5 37 24.7 964.4
19	22 14 48.36 139-33	7 11 25.4 954.7	19	0 05 27.84 138-61	5 53 29.1 961.8
20	22 17 07.69 139-23	6 55 30.7 957.7	20	0 07 46.45 138-68	6 09 30.9 959.0
21	22 19 26.92 139-15	6 39 33.0 960.6	21	0 10 05.13 138-75	6 25 29.9 956.1
22	22 21 46.07 139-06	6 23 32.4 963.2	22	0 12 23.88 138-82	6 41 26.0 953.2
23	22 24 05.13 138-97	6 07 29.2 +965.8	23	0 14 42.70 138-90	6 57 19.2 +950.0
24	22 26 24.10	- 5 51 23.4	24	0 17 01.60	+ 7 13 09.2

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Saturday, September 14			Monday, September 16		
0	^h 17 ^m 01.60 ^s 138.98	+ 7 13 09.2 +945.8	0	^h 2 10 ^m 20.15 ^s 144.83	+18 18 11.4 +674.2
1	0 19 20.58 139.06	7 28 56.0 943.5	1	2 12 44.98 144.96	18 29 25.6 666.4
2	0 21 39.64 139.14	7 44 39.5 940.1	2	2 15 09.94 145.08	18 40 32.0 658.6
3	0 23 58.78 139.24	8 00 19.6 936.5	3	2 17 35.02 145.22	18 51 30.6 650.7
4	0 26 18.02 139.32	8 15 56.1 932.9	4	2 20 00.24 145.34	19 02 21.3 642.7
5	0 28 37.34 139.41	8 31 29.0 929.1	5	2 22 25.58 145.46	19 13 04.0 634.7
6	0 30 56.75 139.51	8 46 58.1 925.2	6	2 24 51.04 145.58	19 23 38.7 626.6
7	0 33 16.26 139.61	9 02 23.3 921.2	7	2 27 16.62 145.70	19 34 05.3 618.5
8	0 35 35.87 139.71	9 17 44.5 917.1	8	2 29 42.32 145.81	19 44 23.8 610.3
9	0 37 55.58 139.81	9 33 01.6 912.9	9	2 32 08.13 145.93	19 54 34.1 602.0
10	0 40 15.39 139.92	9 48 14.5 908.6	10	2 34 34.06 146.05	20 04 36.1 593.7
11	0 42 35.31 140.02	10 03 23.1 904.2	11	2 37 00.11 146.15	20 14 29.8 585.3
12	0 44 55.33 140.13	10 18 27.3 899.7	12	2 39 26.26 146.26	20 24 15.1 576.9
13	0 47 15.46 140.25	10 33 27.0 895.0	13	2 41 52.52 146.37	20 33 52.0 568.4
14	0 49 35.71 140.35	10 48 22.0 890.3	14	2 44 18.89 146.47	20 43 20.4 559.9
15	0 51 56.06 140.48	11 03 12.3 885.5	15	2 46 45.36 146.57	20 52 40.3 551.3
16	0 54 16.54 140.59	11 17 57.8 880.5	16	2 49 11.93 146.67	21 01 51.6 542.7
17	0 56 37.13 140.71	11 32 38.3 875.5	17	2 51 38.60 146.75	21 10 54.3 534.0
18	0 58 57.84 140.83	11 47 13.8 870.4	18	2 54 05.35 146.85	21 19 48.3 525.3
19	1 01 18.67 140.95	12 01 44.2 865.1	19	2 56 32.20 146.94	21 28 33.6 516.5
20	1 03 39.62 141.08	12 16 09.3 859.8	20	2 58 59.14 147.02	21 37 10.1 507.7
21	1 06 00.70 141.21	12 30 29.1 854.4	21	3 01 26.16 147.09	21 45 37.8 498.9
22	1 08 21.91 141.33	12 44 43.5 848.8	22	3 03 53.25 147.18	21 53 56.7 490.0
23	1 10 43.24 141.46	+12 58 52.3 +843.2	23	3 06 20.43 147.25	+22 02 06.7 +481.1
Sunday, September 15			Tuesday, September 17		
0	1 13 04.70 141.59	+13 12 55.5 +837.5	0	3 08 47.68 147.32	+22 10 07.8 +472.1
1	1 15 26.29 141.72	13 26 53.0 831.7	1	3 11 15.00 147.38	22 17 59.9 463.2
2	1 17 48.01 141.85	13 40 44.7 825.7	2	3 13 42.38 147.45	22 25 43.1 454.1
3	1 20 09.86 141.99	13 54 30.4 819.8	3	3 16 09.83 147.51	22 33 17.2 445.0
4	1 22 31.85 142.12	14 08 10.2 813.6	4	3 18 37.34 147.56	22 40 42.2 436.0
5	1 24 53.97 142.26	14 21 43.8 807.5	5	3 21 04.90 147.60	22 47 58.2 426.8
6	1 27 16.23 142.39	14 35 11.3 801.2	6	3 23 32.50 147.66	22 55 05.0 417.8
7	1 29 38.62 142.53	14 48 32.5 794.8	7	3 26 00.16 147.69	23 02 02.8 408.5
8	1 32 01.15 142.66	15 01 47.3 788.4	8	3 28 27.85 147.73	23 08 51.3 399.4
9	1 34 23.81 142.80	15 14 55.7 781.9	9	3 30 55.58 147.76	23 15 30.7 390.1
10	1 36 46.61 142.94	15 27 57.6 775.2	10	3 33 23.34 147.79	23 22 00.8 381.0
11	1 39 09.55 143.07	15 40 52.8 768.5	11	3 35 51.13 147.81	23 28 21.8 371.6
12	1 41 32.62 143.21	15 53 41.3 761.8	12	3 38 18.94 147.83	23 34 33.4 362.4
13	1 43 55.83 143.35	16 06 23.1 754.8	13	3 40 46.77 147.85	23 40 35.8 353.1
14	1 46 19.18 143.49	16 18 57.9 747.9	14	3 43 14.62 147.85	23 46 28.9 343.8
15	1 48 42.67 143.62	16 31 25.8 740.9	15	3 45 42.47 147.86	23 52 12.7 334.4
16	1 51 06.29 143.76	16 43 46.7 733.8	16	3 48 10.33 147.86	23 57 47.1 325.2
17	1 53 30.05 143.90	16 56 00.5 726.5	17	3 50 38.19 147.85	24 03 12.3 315.8
18	1 55 53.95 144.03	17 08 07.0 719.3	18	3 53 06.04 147.84	24 08 28.1 306.4
19	1 58 17.98 144.17	17 20 06.3 712.0	19	3 55 33.88 147.82	24 13 34.5 297.1
20	2 00 42.15 144.30	17 31 58.3 704.6	20	3 58 01.70 147.80	24 18 31.6 287.7
21	2 03 06.45 144.43	17 43 42.9 697.1	21	4 00 29.50 147.77	24 23 19.3 278.4
22	2 05 30.88 144.57	17 55 20.0 689.5	22	4 02 57.27 147.74	24 27 57.7 268.9
23	2 07 55.45 144.70	18 06 49.5 +681.9	23	4 05 25.01 147.71	24 32 26.6 +259.6
24	2 10 20.15	+18 18 11.4	24	4 07 52.72	+24 36 46.2

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Wednesday, September 18					Friday, September 20				
0	h m s	° ' "	h m s	° ' "	0	h m s	° ' "	h m s	° ' "
1	4 07 52.72	147.67	+24 36 46.2	+250.2	1	6 03 36.95	139.67	+25 05 27.8	-175.8
2	4 10 20.39	147.61	24 40 56.4	240.9	2	6 05 56.62	139.40	25 02 32.0	183.7
3	4 12 48.00	147.57	24 44 57.3	231.4	3	6 08 16.02	139.12	24 59 28.3	191.6
4	4 15 15.57	147.50	24 48 48.7	222.1	4	6 10 35.14	138.85	24 56 16.7	199.5
5	4 17 43.07	147.44	24 52 30.8	212.7	5	6 12 53.99	138.57	24 52 57.2	207.2
6	4 20 10.51	147.38	24 56 03.5	203.4	6	6 15 12.56	138.28	24 49 30.0	214.9
7	4 22 37.89	147.30	24 59 26.9	194.0	7	6 17 30.84	138.00	24 45 55.1	222.6
8	4 25 05.19	147.22	25 02 40.9	184.6	8	6 19 48.84	137.71	24 42 12.5	230.3
9	4 27 32.41	147.13	25 05 45.5	175.4	9	6 22 06.55	137.41	24 38 22.2	237.8
10	4 29 59.54	147.05	25 08 40.9	166.0	10	6 24 23.96	137.13	24 34 24.4	245.3
11	4 32 26.59	146.95	25 11 26.9	156.7	11	6 26 41.09	136.83	24 30 19.1	252.8
12	4 34 53.54	146.85	25 14 03.6	147.4	12	6 28 57.92	136.53	24 26 06.3	260.2
13	4 37 20.39	146.74	25 16 31.0	138.1	13	6 31 14.45	136.24	24 21 46.1	267.5
14	4 39 47.13	146.63	25 18 49.1	128.9	14	6 33 30.69	135.93	24 17 18.6	274.8
15	4 42 13.76	146.52	25 20 58.0	119.6	15	6 35 46.62	135.63	24 12 43.8	282.1
16	4 44 40.28	146.39	25 22 57.6	110.4	16	6 38 02.25	135.32	24 08 01.7	289.2
17	4 47 06.67	146.26	25 24 48.0	101.2	17	6 40 17.57	135.02	24 03 12.5	296.4
18	4 49 32.93	146.14	25 26 29.2	92.1	18	6 42 32.59	134.72	23 58 16.1	303.4
19	4 51 59.07	145.99	25 28 01.3	82.8	19	6 44 47.31	134.40	23 53 12.7	310.4
20	4 54 25.06	145.85	25 29 24.1	73.8	20	6 47 01.71	134.09	23 48 02.3	317.4
21	4 56 50.91	145.70	25 30 37.9	64.6	21	6 49 15.80	133.78	23 42 44.9	324.3
22	4 59 16.61	145.55	25 31 42.5	55.6	22	6 51 29.58	133.46	23 37 20.6	331.1
23	5 01 42.16	145.39	25 32 38.1	46.5	23	6 53 43.04	133.16	23 31 49.5	337.8
	5 04 07.55	145.23	+25 33 24.6	+37.4		6 55 56.20	132.83	+23 26 11.7	-344.6
Thursday, September 19					Saturday, September 21				
0	5 06 32.78	145.06	+25 34 02.0	+28.5	0	6 58 09.03	132.52	+23 20 27.1	-351.2
1	5 08 57.84	144.88	25 34 30.5	19.5	1	7 00 21.55	132.21	23 14 35.9	357.9
2	5 11 22.72	144.71	25 34 50.0	10.6	2	7 02 33.76	131.88	23 08 38.0	364.3
3	5 13 47.43	144.52	25 35 00.6	+1.7	3	7 04 45.64	131.57	23 02 33.7	370.9
4	5 16 11.95	144.33	25 35 02.3	-7.2	4	7 06 57.21	131.25	22 56 22.8	377.3
5	5 18 36.28	144.14	25 34 55.1	16.0	5	7 09 08.46	130.94	22 50 05.5	383.6
6	5 21 00.42	143.94	25 34 39.1	24.8	6	7 11 19.40	130.61	22 43 41.9	389.9
7	5 23 24.36	143.74	25 34 14.3	33.5	7	7 13 30.01	130.30	22 37 12.0	396.2
8	5 25 48.10	143.53	25 33 40.8	42.3	8	7 15 40.31	129.98	22 30 35.8	402.4
9	5 28 11.63	143.32	25 32 58.5	50.9	9	7 17 50.29	129.65	22 23 53.4	408.5
10	5 30 34.95	143.11	25 32 07.6	59.5	10	7 19 59.94	129.34	22 17 04.9	414.6
11	5 32 58.06	142.88	25 31 08.1	68.2	11	7 22 09.28	129.02	22 10 10.3	420.6
12	5 35 20.94	142.66	25 29 59.9	76.7	12	7 24 18.30	128.70	22 03 09.7	426.5
13	5 37 43.60	142.43	25 28 43.2	85.2	13	7 26 27.00	128.39	21 56 03.2	432.5
14	5 40 06.03	142.20	25 27 18.0	93.7	14	7 28 35.39	128.06	21 48 50.7	438.2
15	5 42 28.23	141.97	25 25 44.3	102.1	15	7 30 43.45	127.75	21 41 32.5	444.0
16	5 44 50.20	141.72	25 24 02.2	110.5	16	7 32 51.20	127.43	21 34 08.5	449.8
17	5 47 11.92	141.48	25 22 11.7	118.8	17	7 34 58.63	127.11	21 26 38.7	455.4
18	5 49 33.40	141.23	25 20 12.9	127.1	18	7 37 05.74	126.80	21 19 03.3	461.0
19	5 51 54.63	140.98	25 18 05.8	135.3	19	7 39 12.54	126.48	21 11 22.3	466.5
20	5 54 15.61	140.73	25 15 50.5	143.5	20	7 41 19.02	126.17	21 03 35.8	472.1
21	5 56 36.34	140.47	25 13 27.0	151.6	21	7 43 25.19	125.86	20 55 43.7	477.4
22	5 58 56.81	140.20	25 10 55.4	159.8	22	7 45 31.05	125.55	20 47 46.3	482.9
23	6 01 17.01	139.94	25 08 15.6	-167.8	23	7 47 36.60	125.23	20 39 43.4	-488.1
24	6 03 36.95		+25 05 27.8		24	7 49 41.83		+20 31 35.3	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Sunday, September 22							Tuesday, September 24						
0	^h 7 49	^m 41	^s 83	[°] 124 52	['] 20	[″] 31 35.3	0	^h 9 24	^m 23	^s 24	[°] 112 47	['] 12	[″] 35 05.9
1	7 51	46	75	124 62	20	23 21.9	1	9 26	15	71	112 27	12	23 44.3
2	7 53	51	37	124 31	20	15 03.3	2	9 28	07	98	112 09	12	12 19.9
3	7 55	55	68	124 00	20	06 39.6	3	9 30	00	07	111 50	12	00 52.9
4	7 57	59	68	123 70	19	58 10.8	4	9 31	51	97	111 35	11	49 23.4
5	8 00	03	38	123 40	19	49 37.0	5	9 33	43	68	111 18	11	37 51.3
6	8 02	06	78	123 10	19	40 58.2	6	9 35	35	21	111 01	11	26 16.7
7	8 04	09	88	122 79	19	32 14.5	7	9 37	26	56	110 44	11	14 39.6
8	8 06	12	67	122 50	19	23 26.0	8	9 39	17	74	110 27	11	03 00.2
9	8 08	15	17	122 20	19	14 32.6	9	9 41	08	75	110 10	10	51 18.3
10	8 10	17	37	121 51	19	05 34.5	10	9 42	59	59	110 00	10	39 34.2
11	8 12	19	28	121 31	18	56 31.8	11	9 44	50	27	109 53	10	27 47.8
12	8 14	20	89	121 61	18	47 24.4	12	9 46	40	78	109 36	10	15 59.2
13	8 16	22	22	121 33	18	38 12.5	13	9 48	31	14	109 19	10	04 08.4
14	8 18	23	25	121 03	18	28 56.0	14	9 50	21	34	109 02	9	52 15.5
15	8 20	24	00	120 75	18	19 35.0	15	9 52	11	39	108 45	9	40 20.5
16	8 22	24	46	120 46	18	10 09.7	16	9 54	01	29	108 28	9	28 23.4
17	8 24	24	64	120 18	18	00 40.0	17	9 55	51	05	108 11	9	16 24.4
18	8 26	24	54	119 50	17	51 05.9	18	9 57	40	66	107 54	9	04 23.4
19	8 28	24	16	119 21	17	41 27.7	19	9 59	30	14	107 37	8	52 20.4
20	8 30	23	50	118 52	17	31 45.2	20	10 01	19	48	107 20	8	40 15.7
21	8 32	22	57	118 23	17	21 58.6	21	10 03	08	69	107 03	8	28 09.1
22	8 34	21	37	117 54	17	12 08.0	22	10 04	57	77	106 46	8	16 00.7
23	8 36	19	90	117 25	17	02 13.3	23	10 06	46	73	106 29	7	03 50.6
				118 26	-598.7						108 83	+ 8 03	50.6
													-731.8
Monday, September 23							Wednesday, September 25						
0	8 38	18	16	118 00	+16 52	14.6	0	10 08	35	56	108 72	+ 7 51	38.8
1	8 40	16	16	117 43	16 42	12.0	1	10 10	24	28	108 60	7 39	25.3
2	8 42	13	89	117 26	16 32	05.5	2	10 12	12	88	108 49	7 27	10.3
3	8 44	11	37	117 09	16 21	55.2	3	10 14	01	37	108 38	7 14	53.7
4	8 46	08	59	116 52	16 11	41.2	4	10 15	49	75	108 28	7 02	35.5
5	8 48	05	56	116 35	16 01	23.4	5	10 17	38	03	108 17	6 50	15.9
6	8 50	02	27	116 18	15 51	01.9	6	10 19	26	20	108 08	6 37	54.9
7	8 51	58	74	116 01	15 40	36.9	7	10 21	14	28	107 58	6 25	32.5
8	8 53	54	95	115 44	15 30	08.2	8	10 23	02	26	107 48	6 13	08.7
9	8 55	50	93	115 27	15 19	36.0	9	10 24	50	16	107 39	6 00	43.6
10	8 57	46	66	115 10	15 09	00.4	10	10 26	37	96	107 30	5 48	17.3
11	8 59	42	16	114 53	14 58	21.4	11	10 28	25	68	107 22	5 35	49.8
12	9 01	37	42	114 36	14 47	39.0	12	10 30	13	32	107 14	5 23	21.1
13	9 03	32	45	114 19	14 36	53.3	13	10 32	00	88	107 06	5 10	51.3
14	9 05	27	24	114 02	14 26	04.3	14	10 33	48	37	106 58	4 58	20.4
15	9 07	21	81	113 45	14 15	12.2	15	10 35	35	79	106 49	4 45	48.4
16	9 09	16	16	113 28	14 04	16.8	16	10 37	23	14	106 40	4 33	15.4
17	9 11	10	29	113 11	13 53	18.3	17	10 39	10	42	106 32	4 20	41.5
18	9 13	04	20	112 54	13 42	16.8	18	10 40	57	65	106 23	4 08	06.7
19	9 14	57	89	112 37	13 31	12.3	19	10 42	44	82	106 15	3 55	30.9
20	9 16	51	37	112 20	13 20	04.7	20	10 44	31	93	106 07	3 42	54.4
21	9 18	44	65	112 03	13 08	54.3	21	10 46	19	00	106 00	3 30	17.0
22	9 20	37	71	111 46	12 57	41.0	22	10 48	06	02	105 52	3 17	38.9
23	9 22	30	58	111 29	12 46	24.8	23	10 49	53	00	105 43	3 05	00.2
24	9 24	23	24	111 12	+12 35	05.9	24	10 51	39	94	105 34	+ 2 52	20.7
						-678.9							-759.5

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Thursday, September 26							Saturday, September 28						
0	10 ^h 51 ^m 39 ^s .94	106 [°] .90	+	2 [°] 52' 20 ^{''} .7	-760 ^{''} .1		0	12 ^h 17 ^m 33 ^s .68	109 [°] .18	-	7 [°] 14' 18 ^{''} .0	-739 ^{''} .4	
1	10 53 26.84	106.87		2 39 40.6	760.6		1	12 19 22.86	109.32		7 26 37.4	737.9	
2	10 55 13.71	106.84		2 27 00.0	761.2		2	12 21 12.18	109.44		7 38 55.3	736.3	
3	10 57 00.55	106.81		2 14 18.8	761.7		3	12 23 01.62	109.58		7 51 11.6	734.7	
4	10 58 47.36	106.80		2 01 37.1	762.2		4	12 24 51.20	109.72		8 03 26.3	733.0	
5	11 00 34.16	106.77		1 48 54.9	762.5		5	12 26 40.92	109.86		8 15 39.3	731.4	
6	11 02 20.93	106.76		1 36 12.4	763.0		6	12 28 30.78	110.00		8 27 50.7	729.5	
7	11 04 07.69	106.74		1 23 29.4	763.2		7	12 30 20.78	110.16		8 40 00.2	727.8	
8	11 05 54.43	106.74		1 10 46.2	763.5		8	12 32 10.94	110.30		8 52 08.0	725.9	
9	11 07 41.17	106.74		0 58 02.7	763.8		9	12 34 01.24	110.46		9 04 13.9	724.1	
10	11 09 27.91	106.73		0 45 18.9	764.0		10	12 35 51.70	110.62		9 16 18.0	722.1	
11	11 11 14.64	106.73		0 32 34.9	764.1		11	12 37 42.32	110.78		9 28 20.1	720.1	
12	11 13 01.37	106.74		0 19 50.8	764.2		12	12 39 33.10	110.94		9 40 20.2	718.1	
13	11 14 48.11	106.75	+	0 07 06.6	764.3		13	12 41 24.04	111.11		9 52 18.3	715.9	
14	11 16 34.86	106.76	-	0 05 37.7	764.4		14	12 43 15.15	111.28		10 04 14.2	713.9	
15	11 18 21.62	106.77		0 18 22.1	764.3		15	12 45 06.43	111.46		10 16 08.1	711.6	
16	11 20 08.39	106.80		0 31 06.4	764.2		16	12 46 57.89	111.63		10 27 59.7	709.4	
17	11 21 55.19	106.81		0 43 50.6	764.2		17	12 48 49.52	111.80		10 39 49.1	707.1	
18	11 23 42.00	106.84		0 56 34.8	764.0		18	12 50 41.32	111.99		10 51 36.2	704.8	
19	11 25 28.84	106.88		1 09 18.8	763.9		19	12 52 33.31	112.18		11 03 21.0	702.4	
20	11 27 15.72	106.90		1 22 02.7	763.6		20	12 54 25.49	112.36		11 15 03.4	699.9	
21	11 29 02.62	106.94		1 34 46.3	763.3		21	12 56 17.85	112.56		11 26 43.3	697.5	
22	11 30 49.56	106.98		1 47 29.6	763.0		22	12 58 10.41	112.75		11 38 20.8	694.9	
23	11 32 36.54	107.02	-	2 00 12.6	-762.7		23	13 00 03.16	112.94	-	11 49 55.7	-692.4	
Friday, September 27							Sunday, September 29						
0	11 34 23.56	107.07	-	2 12 55.3	-762.3		0	13 01 56.10	113.14	-	12 01 28.1	-689.7	
1	11 36 10.63	107.12		2 25 37.6	761.8		1	13 03 49.24	113.35		12 12 57.8	687.0	
2	11 37 57.75	107.17		2 38 19.4	761.3		2	13 05 42.59	113.55		12 24 24.8	684.3	
3	11 39 44.92	107.23		2 51 00.7	760.8		3	13 07 36.14	113.76		12 35 49.1	681.5	
4	11 41 32.15	107.28		3 03 41.5	760.2		4	13 09 29.90	113.97		12 47 10.6	678.7	
5	11 43 19.43	107.35		3 16 21.7	759.6		5	13 11 23.87	114.19		12 58 29.3	675.8	
6	11 45 06.78	107.42		3 29 01.3	759.0		6	13 13 18.06	114.40		13 09 45.1	672.8	
7	11 46 54.20	107.48		3 41 40.3	758.2		7	13 15 12.46	114.62		13 20 57.9	669.9	
8	11 48 41.68	107.56		3 54 18.5	757.5		8	13 17 07.08	114.84		13 32 07.8	666.8	
9	11 50 29.24	107.64		4 06 56.0	756.7		9	13 19 01.92	115.06		13 43 14.6	663.6	
10	11 52 16.88	107.71		4 19 32.7	755.8		10	13 20 56.98	115.29		13 54 18.2	660.6	
11	11 54 04.59	107.80		4 32 08.5	755.0		11	13 22 52.27	115.52		14 05 18.8	657.3	
12	11 55 52.39	107.88		4 44 43.5	754.0		12	13 24 47.79	115.75		14 16 16.1	654.1	
13	11 57 40.27	107.98		4 57 17.5	753.1		13	13 26 43.54	115.99		14 27 10.2	650.7	
14	11 59 28.25	108.07		5 09 50.6	752.1		14	13 28 39.53	116.22		14 38 00.9	647.4	
15	12 01 16.32	108.16		5 22 22.7	751.0		15	13 30 35.75	116.46		14 48 48.3	644.0	
16	12 03 04.48	108.27		5 34 53.7	749.9		16	13 32 32.21	116.70		14 59 32.3	640.5	
17	12 04 52.75	108.37		5 47 23.6	748.7		17	13 34 28.91	116.95		15 10 12.8	637.0	
18	12 06 41.12	108.47		5 59 52.3	747.5		18	13 36 25.86	117.19		15 20 49.8	633.5	
19	12 08 29.59	108.59		6 12 19.8	746.3		19	13 38 23.05	117.44		15 31 23.3	629.7	
20	12 10 18.18	108.70		6 24 46.1	745.1		20	13 40 20.49	117.69		15 41 53.0	626.1	
21	12 12 06.88	108.81		6 37 11.2	743.6		21	13 42 18.18	117.95		15 52 19.1	622.4	
22	12 13 55.69	108.93		6 49 34.8	742.3		22	13 44 16.13	118.19		16 02 41.5	618.5	
23	12 15 44.62	109.06		7 01 57.1	-740.9		23	13 46 14.32	118.46		16 13 00.0	-614.7	
24	12 17 33.68		-	7 14 18.0			24	13 48 12.78		-	16 23 14.7		

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Monday, September 30			Wednesday, October 2		
0	^h 13 ^m 48 ^s 12.78 [°] 118.71 ['] -16 23 14.7 ["] -610.8		0	^h 15 ^m 28 ^s 28.86 [°] 132.46 ['] -23 00 55.7 ["] -356.1	
1	13 50 11.49 [°] 118.98 ['] 16 33 25.5 ["] 606.8		1	15 30 41.32 [°] 132.75 ['] 23 06 51.8 ["] 349.5	
2	13 52 10.47 [°] 119.23 ['] 16 43 32.3 ["] 602.8		2	15 32 54.07 [°] 133.04 ['] 23 12 41.3 ["] 342.6	
3	13 54 09.70 [°] 119.50 ['] 16 53 35.1 ["] 598.7		3	15 35 07.11 [°] 133.31 ['] 23 18 23.9 ["] 335.9	
4	13 56 09.20 [°] 119.77 ['] 17 03 33.8 ["] 594.6		4	15 37 20.42 [°] 133.60 ['] 23 23 59.8 ["] 329.0	
5	13 58 08.97 [°] 120.04 ['] 17 13 28.4 ["] 590.3		5	15 39 34.02 [°] 133.88 ['] 23 29 28.8 ["] 322.0	
6	14 00 09.01 [°] 120.31 ['] 17 23 18.7 ["] 586.2		6	15 41 47.90 [°] 134.15 ['] 23 34 50.8 ["] 315.1	
7	14 02 09.32 [°] 120.58 ['] 17 33 04.9 ["] 581.8		7	15 44 02.05 [°] 134.43 ['] 23 40 05.9 ["] 308.1	
8	14 04 09.90 [°] 120.85 ['] 17 42 46.7 ["] 577.5		8	15 46 16.48 [°] 134.70 ['] 23 45 14.0 ["] 301.0	
9	14 06 10.75 [°] 121.13 ['] 17 52 24.2 ["] 573.0		9	15 48 31.18 [°] 134.97 ['] 23 50 15.0 ["] 293.9	
10	14 08 11.88 [°] 121.41 ['] 18 01 57.2 ["] 568.6		10	15 50 46.15 [°] 135.25 ['] 23 55 08.9 ["] 286.7	
11	14 10 13.29 [°] 121.69 ['] 18 11 25.8 ["] 564.1		11	15 53 01.40 [°] 135.51 ['] 23 59 55.6 ["] 279.5	
12	14 12 14.98 [°] 121.97 ['] 18 20 49.9 ["] 559.5		12	15 55 16.91 [°] 135.77 ['] 24 04 35.1 ["] 272.2	
13	14 14 16.95 [°] 122.25 ['] 18 30 09.4 ["] 554.8		13	15 57 32.68 [°] 136.04 ['] 24 09 07.3 ["] 264.9	
14	14 16 19.20 [°] 122.53 ['] 18 39 24.2 ["] 550.2		14	15 59 48.72 [°] 136.30 ['] 24 13 32.2 ["] 257.4	
15	14 18 21.73 [°] 122.81 ['] 18 48 34.4 ["] 545.3		15	16 02 05.02 [°] 136.56 ['] 24 17 49.6 ["] 250.1	
16	14 20 24.54 [°] 123.10 ['] 18 57 39.7 ["] 540.6		16	16 04 21.58 [°] 136.81 ['] 24 21 59.7 ["] 242.5	
17	14 22 27.64 [°] 123.39 ['] 19 06 40.3 ["] 535.7		17	16 06 38.39 [°] 137.06 ['] 24 26 02.2 ["] 235.0	
18	14 24 31.03 [°] 123.68 ['] 19 15 36.0 ["] 530.8		18	16 08 55.45 [°] 137.31 ['] 24 29 57.2 ["] 227.5	
19	14 26 34.71 [°] 123.96 ['] 19 24 26.8 ["] 525.7		19	16 11 12.76 [°] 137.56 ['] 24 33 44.7 ["] 219.8	
20	14 28 38.67 [°] 124.25 ['] 19 33 12.5 ["] 520.8		20	16 13 30.32 [°] 137.80 ['] 24 37 24.5 ["] 212.1	
21	14 30 42.92 [°] 124.55 ['] 19 41 53.3 ["] 515.6		21	16 15 48.12 [°] 138.04 ['] 24 40 56.6 ["] 204.5	
22	14 32 47.47 [°] 124.83 ['] 19 50 28.9 ["] 510.5		22	16 18 06.16 [°] 138.28 ['] 24 44 21.1 ["] 196.6	
23	14 34 52.30 [°] 125.13 ['] -19 58 59.4 ["] -505.2		23	16 20 24.44 [°] 138.51 ['] -24 47 37.7 ["] -188.9	
Tuesday, October 1			Thursday, October 3		
0	14 36 57.43 [°] 125.42 ['] -20 07 24.6 ["] -500.0		0	16 22 42.95 [°] 138.74 ['] -24 50 46.6 ["] -181.0	
1	14 39 02.85 [°] 125.71 ['] 20 15 44.6 ["] 494.6		1	16 25 01.69 [°] 138.97 ['] 24 53 47.6 ["] 173.1	
2	14 41 08.56 [°] 126.01 ['] 20 23 59.2 ["] 489.3		2	16 27 20.66 [°] 139.20 ['] 24 56 40.7 ["] 165.2	
3	14 43 14.57 [°] 126.30 ['] 20 32 08.5 ["] 483.8		3	16 29 39.86 [°] 139.41 ['] 24 59 25.9 ["] 157.1	
4	14 45 20.87 [°] 126.60 ['] 20 40 12.3 ["] 478.3		4	16 31 59.27 [°] 139.63 ['] 25 02 03.0 ["] 149.2	
5	14 47 27.47 [°] 126.89 ['] 20 48 10.6 ["] 472.8		5	16 34 18.90 [°] 139.84 ['] 25 04 32.2 ["] 141.1	
6	14 49 34.36 [°] 127.19 ['] 20 56 03.4 ["] 467.1		6	16 36 38.74 [°] 140.05 ['] 25 06 53.3 ["] 133.0	
7	14 51 41.55 [°] 127.48 ['] 21 03 50.5 ["] 461.5		7	16 38 58.79 [°] 140.25 ['] 25 09 06.3 ["] 124.9	
8	14 53 49.03 [°] 127.78 ['] 21 11 32.0 ["] 455.7		8	16 41 19.04 [°] 140.46 ['] 25 11 11.2 ["] 116.6	
9	14 55 56.81 [°] 128.08 ['] 21 19 07.7 ["] 449.9		9	16 43 39.50 [°] 140.66 ['] 25 13 07.8 ["] 108.5	
10	14 58 04.89 [°] 128.37 ['] 21 26 37.6 ["] 444.0		10	16 46 00.16 [°] 140.84 ['] 25 14 56.3 ["] 100.2	
11	15 00 13.26 [°] 128.67 ['] 21 34 01.6 ["] 438.2		11	16 48 21.00 [°] 141.04 ['] 25 16 36.5 ["] 91.9	
12	15 02 21.93 [°] 128.96 ['] 21 41 19.8 ["] 432.2		12	16 50 42.04 [°] 141.22 ['] 25 18 08.4 ["] 83.6	
13	15 04 30.89 [°] 129.26 ['] 21 48 32.0 ["] 426.1		13	16 53 03.26 [°] 141.40 ['] 25 19 32.0 ["] 75.2	
14	15 06 40.15 [°] 129.55 ['] 21 55 38.1 ["] 420.1		14	16 55 24.66 [°] 141.58 ['] 25 20 47.2 ["] 66.8	
15	15 08 49.70 [°] 129.85 ['] 22 02 38.2 ["] 413.9		15	16 57 46.24 [°] 141.75 ['] 25 21 54.0 ["] 58.4	
16	15 10 59.55 [°] 130.15 ['] 22 09 32.1 ["] 407.7		16	17 00 07.99 [°] 141.91 ['] 25 22 52.4 ["] 50.0	
17	15 13 09.70 [°] 130.43 ['] 22 16 19.8 ["] 401.5		17	17 02 29.90 [°] 142.08 ['] 25 23 42.4 ["] 41.4	
18	15 15 20.13 [°] 130.73 ['] 22 23 01.3 ["] 395.2		18	17 04 51.98 [°] 142.24 ['] 25 24 23.8 ["] 32.9	
19	15 17 30.86 [°] 131.02 ['] 22 29 36.5 ["] 388.8		19	17 07 14.22 [°] 142.39 ['] 25 24 56.7 ["] 24.4	
20	15 19 41.88 [°] 131.31 ['] 22 36 05.3 ["] 382.3		20	17 09 36.61 [°] 142.55 ['] 25 25 21.1 ["] 15.8	
21	15 21 53.19 [°] 131.60 ['] 22 42 27.6 ["] 375.9		21	17 11 59.16 [°] 142.68 ['] 25 25 36.9 ["] - 7.2	
22	15 24 04.79 [°] 131.89 ['] 22 48 43.5 ["] 369.4		22	17 14 21.84 [°] 142.83 ['] 25 25 44.1 ["] + 1.4	
23	15 26 16.68 [°] 132.18 ['] 22 54 52.9 ["] -362.8		23	17 16 44.67 [°] 142.97 ['] 25 25 42.7 ["] + 10.1	
24	15 28 28.86 [°] -23 00 55.7 ["]		24	17 19 07.64 [°]	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Friday, October 4			Sunday, October 6		
0	^h 17 ^m 19 ^s 07.64 ^a 143.09	-25 25 32.6 + 18.8	0	^h 19 ^m 14 ^s 35.83 ^a 143.89	-22 24 23.2 + 441.2
1	17 21 30.73 143.22	25 25 13.8 27.4	1	19 16 59.72 143.80	22 17 02.0 449.7
2	17 23 53.95 143.35	25 24 46.4 36.2	2	19 19 23.52 143.72	22 09 32.3 458.0
3	17 26 17.30 143.46	25 24 10.2 45.0	3	19 21 47.24 143.63	22 01 54.3 466.5
4	17 28 40.76 143.57	25 23 25.2 53.6	4	19 24 10.87 143.54	21 54 07.8 474.8
5	17 31 04.33 143.67	25 22 31.6 62.5	5	19 26 34.41 143.44	21 46 13.0 483.1
6	17 33 28.00 143.78	25 21 29.1 71.3	6	19 28 57.85 143.35	21 38 09.9 491.4
7	17 35 51.78 143.88	25 20 17.8 80.0	7	19 31 21.20 143.26	21 29 58.5 499.6
8	17 38 15.66 143.97	25 18 57.8 88.9	8	19 33 44.46 143.15	21 21 38.9 507.8
9	17 40 39.63 144.06	25 17 28.9 97.7	9	19 36 07.61 143.05	21 13 11.1 515.9
10	17 43 03.69 144.13	25 15 51.2 106.6	10	19 38 30.66 142.95	21 04 35.2 524.1
11	17 45 27.82 144.22	25 14 04.6 115.5	11	19 40 53.61 142.84	20 55 51.1 532.1
12	17 47 52.04 144.29	25 12 09.1 124.3	12	19 43 16.45 142.73	20 46 59.0 540.1
13	17 50 16.33 144.36	25 10 04.8 133.2	13	19 45 39.18 142.62	20 37 58.9 548.1
14	17 52 40.69 144.41	25 07 51.6 142.2	14	19 48 01.80 142.51	20 28 50.8 556.1
15	17 55 05.10 144.48	25 05 29.4 151.0	15	19 50 24.31 142.39	20 19 34.7 563.9
16	17 57 29.58 144.53	25 02 58.4 159.9	16	19 52 46.70 142.28	20 10 10.8 571.8
17	17 59 54.11 144.57	25 00 18.5 168.9	17	19 55 08.98 142.16	20 00 39.0 579.5
18	18 02 18.68 144.62	24 57 29.6 177.7	18	19 57 31.14 142.05	19 50 59.5 587.3
19	18 04 43.30 144.66	24 54 31.9 186.7	19	19 59 53.19 141.92	19 41 12.2 595.0
20	18 07 07.96 144.69	24 51 25.2 195.6	20	20 02 15.11 141.81	19 31 17.2 602.6
21	18 09 32.65 144.73	24 48 09.6 204.5	21	20 04 36.92 141.68	19 21 14.6 610.1
22	18 11 57.38 144.74	24 44 45.1 213.4	22	20 06 58.60 141.56	19 11 04.5 617.7
23	18 14 22.12 144.77	-24 41 11.7 + 222.4	23	20 09 20.16 141.44	-19 00 46.8 + 625.2
Saturday, October 5			Monday, October 7		
0	18 16 46.89 144.78	-24 37 29.3 + 231.3	0	20 11 41.60 141.31	-18 50 21.6 + 632.6
1	18 19 11.67 144.79	24 33 38.0 240.1	1	20 14 02.91 141.19	18 39 49.0 639.9
2	18 21 36.46 144.80	24 29 37.9 249.1	2	20 16 24.10 141.07	18 29 09.1 647.3
3	18 24 01.26 144.80	24 25 28.8 258.0	3	20 18 45.17 140.94	18 18 21.8 654.4
4	18 26 26.06 144.80	24 21 10.8 266.9	4	20 21 06.11 140.81	18 07 27.4 661.7
5	18 28 50.86 144.78	24 16 43.9 275.8	5	20 23 26.92 140.68	17 56 25.7 668.7
6	18 31 15.64 144.78	24 12 08.1 284.6	6	20 25 47.60 140.56	17 45 17.0 675.8
7	18 33 40.42 144.76	24 07 23.5 293.5	7	20 28 08.16 140.44	17 34 01.2 682.8
8	18 36 05.18 144.74	24 02 30.0 302.3	8	20 30 28.60 140.31	17 22 38.4 689.8
9	18 38 29.92 144.71	23 57 27.7 311.2	9	20 32 48.91 140.18	17 11 08.6 696.5
10	18 40 54.63 144.69	23 52 16.5 320.0	10	20 35 09.09 140.06	16 59 32.1 703.4
11	18 43 19.32 144.65	23 46 56.5 328.8	11	20 37 29.15 139.93	16 47 48.7 710.2
12	18 45 43.97 144.62	23 41 27.7 337.6	12	20 39 49.08 139.81	16 35 58.5 716.8
13	18 48 08.59 144.57	23 35 50.1 346.3	13	20 42 08.89 139.68	16 24 01.7 723.4
14	18 50 33.16 144.53	23 30 03.8 355.1	14	20 44 28.57 139.56	16 11 58.3 729.9
15	18 52 57.69 144.48	23 24 08.7 363.8	15	20 46 48.13 139.44	15 59 48.4 736.4
16	18 55 22.17 144.43	23 18 04.9 372.6	16	20 49 07.57 139.32	15 47 32.0 742.7
17	18 57 46.60 144.37	23 11 52.3 381.2	17	20 51 26.89 139.20	15 35 09.3 749.1
18	19 00 10.97 144.31	23 05 31.1 389.8	18	20 53 46.09 139.07	15 22 40.2 755.4
19	19 02 35.28 144.25	22 59 01.3 398.5	19	20 56 05.16 138.96	15 10 04.8 761.5
20	19 04 59.53 144.18	22 52 22.8 407.1	20	20 58 24.12 138.84	14 57 23.3 767.6
21	19 07 23.71 144.12	22 45 35.7 415.6	21	21 00 42.96 138.72	14 44 35.7 773.6
22	19 09 47.83 144.04	22 38 40.1 424.2	22	21 03 01.68 138.61	14 31 42.1 779.5
23	19 12 11.87 143.96	22 31 35.9 + 432.7	23	21 05 20.29 138.49	14 18 42.6 + 785.5
24	19 14 35.83	-22 24 23.2	24	21 07 38.78	-14 05 37.1

MOON, 1935

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Tuesday, October 8			Thursday, October 10		
0	^{h m s} 21 07 38.78 138.38	^{° ′ ″} -14 05 37.1 +791.2	0	^{h m s} 22 56 57.33 135.99	^{° ′ ″} -2 10 10.0 +964.6
1	21 09 57.16 138.27	13 52 25.9 797.0	1	22 59 13.32 136.02	1 54 05.4 965.8
2	21 12 15.43 138.16	13 39 08.9 802.6	2	23 01 29.34 136.05	1 37 59.6 966.8
3	21 14 33.59 138.05	13 25 46.3 808.1	3	23 03 45.39 136.09	1 21 52.8 967.7
4	21 16 51.64 137.95	13 12 18.2 813.7	4	23 06 01.48 136.14	1 05 45.1 968.6
5	21 19 09.59 137.84	12 58 44.5 819.0	5	23 08 17.62 136.18	0 49 36.5 969.3
6	21 21 27.43 137.74	12 45 05.5 824.4	6	23 10 33.80 136.23	0 33 27.2 969.9
7	21 23 45.17 137.64	12 31 21.1 829.5	7	23 12 50.03 136.28	0 17 17.3 970.4
8	21 26 02.81 137.55	12 17 31.6 834.8	8	23 15 06.31 136.34	- 0 01 06.9 970.7
9	21 28 20.36 137.45	12 03 36.8 839.8	9	23 17 22.65 136.40	+ 0 15 03.8 971.1
10	21 30 37.81 137.36	11 49 37.0 844.8	10	23 19 39.05 136.46	0 31 14.9 971.2
11	21 32 55.17 137.26	11 35 32.2 849.7	11	23 21 55.51 136.53	0 47 26.1 971.3
12	21 35 12.43 137.18	11 21 22.5 854.5	12	23 24 12.04 136.60	1 03 37.4 971.2
13	21 37 29.61 137.09	11 07 08.0 859.2	13	23 26 28.64 136.68	1 19 48.6 971.0
14	21 39 46.70 137.00	10 52 48.8 863.9	14	23 28 45.32 136.75	1 35 59.6 970.7
15	21 42 03.70 136.93	10 38 24.9 868.4	15	23 31 02.07 136.84	1 52 10.3 970.3
16	21 44 20.63 136.85	10 23 56.5 872.8	16	23 33 18.91 136.92	2 08 20.6 969.8
17	21 46 37.48 136.77	10 09 23.7 877.3	17	23 35 35.83 137.01	2 24 30.4 969.2
18	21 48 54.25 136.70	9 54 46.4 881.5	18	23 37 52.84 137.11	2 40 39.6 968.4
19	21 51 10.95 136.63	9 40 04.9 885.6	19	23 40 09.95 137.20	2 56 48.0 967.5
20	21 53 27.58 136.56	9 25 19.3 889.8	20	23 42 27.15 137.31	3 12 55.5 966.5
21	21 55 44.14 136.50	9 10 29.5 893.8	21	23 44 44.46 137.40	3 29 02.0 965.5
22	21 58 00.64 136.44	8 55 35.7 897.8	22	23 47 01.86 137.52	3 45 07.5 964.2
23	22 00 17.08 136.37	- 8 40 37.9 +901.5	23	23 49 19.38 137.62	+ 4 01 11.7 +962.9
Wednesday, October 9			Friday, October 11		
0	22 02 33.45 136.32	- 8 25 36.4 +905.3	0	23 51 37.00 137.74	+ 4 17 14.6 +961.5
1	22 04 49.77 136.27	8 10 31.1 908.8	1	23 53 54.74 137.85	4 33 16.1 959.9
2	22 07 06.04 136.22	7 55 22.3 912.4	2	23 56 12.59 137.97	4 49 16.0 958.2
3	22 09 22.26 136.17	7 40 09.9 915.9	3	23 58 30.56 138.10	5 05 14.2 956.4
4	22 11 38.43 136.13	7 24 54.0 919.2	4	0 00 48.66 138.23	5 21 10.6 954.5
5	22 13 54.56 136.09	7 09 34.8 922.4	5	0 03 06.89 138.35	5 37 05.1 952.4
6	22 16 10.65 136.06	6 54 12.4 925.6	6	0 05 25.24 138.49	5 52 57.5 950.3
7	22 18 26.71 136.02	6 38 46.8 928.6	7	0 07 43.73 138.62	6 08 47.8 948.1
8	22 20 42.73 135.99	6 23 18.2 931.5	8	0 10 02.35 138.77	6 24 35.9 945.7
9	22 22 58.72 135.96	6 07 46.7 934.4	9	0 12 21.12 138.91	6 40 21.6 943.1
10	22 25 14.68 135.94	5 52 12.3 937.1	10	0 14 40.03 139.05	6 56 04.7 940.6
11	22 27 30.62 135.92	5 36 35.2 939.8	11	0 16 59.08 139.20	7 11 45.3 937.8
12	22 29 46.54 135.90	5 20 55.4 942.3	12	0 19 18.28 139.35	7 27 23.1 935.0
13	22 32 02.44 135.89	5 05 13.1 944.8	13	0 21 37.63 139.51	7 42 58.1 932.0
14	22 34 18.33 135.89	4 49 28.3 947.1	14	0 23 57.14 139.66	7 58 30.1 928.9
15	22 36 34.22 135.87	4 33 41.2 949.3	15	0 26 16.80 139.82	8 13 59.0 925.7
16	22 38 50.09 135.88	4 17 51.9 951.4	16	0 28 36.62 139.99	8 29 24.7 922.4
17	22 41 05.97 135.87	4 02 00.5 953.5	17	0 30 56.61 140.15	8 44 47.1 919.0
18	22 43 21.84 135.88	3 46 07.0 955.3	18	0 33 16.76 140.31	9 00 06.1 915.4
19	22 45 37.72 135.89	3 30 11.7 957.1	19	0 35 37.07 140.49	9 15 21.5 911.8
20	22 47 53.61 135.91	3 14 14.6 958.9	20	0 37 57.56 140.65	9 30 33.3 908.0
21	22 50 09.52 135.91	2 58 15.7 960.4	21	0 40 18.21 140.83	9 45 41.3 904.1
22	22 52 25.43 135.94	2 42 15.3 962.0	22	0 42 39.04 141.00	10 00 45.4 900.0
23	22 54 41.37 135.96	2 26 13.3 +963.3	23	0 45 00.04 141.18	10 15 45.4 +896.0
24	22 56 57.33	- 2 10 10.0	24	0 47 21.22	+ 10 30 41.4

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Saturday, October 12			Monday, October 14		
0	^{h m s} 0 47 21.22 141.36	+10 30 41.4 +891.8	0	^{h m s} 2 44 01.97 150.22	+20 31 54.2 +568.3
1	0 49 42.58 141.54	10 45 33.2 887.3	1	2 46 32.19 150.36	20 41 22.5 559.5
2	0 52 04.12 141.73	11 00 20.5 882.9	2	2 49 02.55 150.49	20 50 42.0 550.5
3	0 54 25.85 141.91	11 15 03.4 878.4	3	2 51 33.04 150.63	20 59 52.5 541.7
4	0 56 47.76 142.10	11 29 41.8 873.7	4	2 54 03.67 150.75	21 08 54.2 532.6
5	0 59 09.86 142.28	11 44 15.5 868.8	5	2 56 34.42 150.88	21 17 46.8 523.6
6	1 01 32.14 142.48	11 58 44.3 864.0	6	2 59 05.30 150.99	21 26 30.4 514.6
7	1 03 54.62 142.66	12 13 08.3 858.9	7	3 01 36.29 151.10	21 35 05.0 505.3
8	1 06 17.28 142.86	12 27 27.2 853.8	8	3 04 07.39 151.21	21 43 30.3 496.2
9	1 08 40.14 143.05	12 41 41.0 848.5	9	3 06 38.60 151.32	21 51 46.5 486.9
10	1 11 03.19 143.25	12 55 49.5 843.2	10	3 09 09.92 151.41	21 59 53.4 477.6
11	1 13 26.44 143.44	13 09 52.7 837.8	11	3 11 41.33 151.51	22 07 51.0 468.3
12	1 15 49.88 143.64	13 23 50.5 832.2	12	3 14 12.84 151.60	22 15 39.3 458.9
13	1 18 13.52 143.83	13 37 42.7 826.5	13	3 16 44.44 151.68	22 23 18.2 449.4
14	1 20 37.35 144.03	13 51 29.2 820.8	14	3 19 16.12 151.75	22 30 47.6 439.9
15	1 23 01.38 144.23	14 05 10.0 814.8	15	3 21 47.87 151.83	22 38 07.5 430.5
16	1 25 25.61 144.43	14 18 44.8 808.9	16	3 24 19.70 151.90	22 45 18.0 420.8
17	1 27 50.04 144.63	14 32 13.7 802.8	17	3 26 51.60 151.95	22 52 18.8 411.3
18	1 30 14.67 144.82	14 45 36.5 796.5	18	3 29 23.55 152.01	22 59 10.1 401.7
19	1 32 39.49 145.03	14 58 53.0 790.3	19	3 31 55.56 152.06	23 05 51.8 392.1
20	1 35 04.52 145.22	15 12 03.3 783.9	20	3 34 27.62 152.09	23 12 23.9 382.4
21	1 37 29.74 145.42	15 25 07.2 777.4	21	3 36 59.71 152.14	23 18 46.3 372.7
22	1 39 55.16 145.62	15 38 04.6 770.8	22	3 39 31.85 152.17	23 24 59.0 362.9
23	1 42 20.78 145.81	+15 50 55.4 +764.1	23	3 42 04.02 152.19	+23 31 01.9 +353.2
Sunday, October 13			Tuesday, October 15		
0	1 44 46.59 146.01	+16 03 39.5 +757.3	0	3 44 36.21 152.21	+23 36 55.1 +343.4
1	1 47 12.60 146.21	16 16 16.8 750.4	1	3 47 08.42 152.22	23 42 38.5 333.7
2	1 49 38.81 146.41	16 28 47.2 743.5	2	3 49 40.64 152.23	23 48 12.2 323.8
3	1 52 05.22 146.60	16 41 10.7 736.3	3	3 52 12.87 152.23	23 53 36.0 314.0
4	1 54 31.82 146.79	16 53 27.0 729.2	4	3 54 45.10 152.22	23 58 50.0 304.1
5	1 56 58.61 146.99	17 05 36.2 721.9	5	3 57 17.32 152.20	24 03 54.1 294.3
6	1 59 25.60 147.18	17 17 38.1 714.6	6	3 59 49.52 152.18	24 08 48.4 284.5
7	2 01 52.78 147.36	17 29 32.7 707.1	7	4 02 21.70 152.16	24 13 32.9 274.7
8	2 04 20.14 147.55	17 41 19.8 699.6	8	4 04 53.86 152.12	24 18 07.6 264.7
9	2 06 47.69 147.74	17 52 59.4 692.0	9	4 07 25.98 152.09	24 22 32.3 254.9
10	2 09 15.43 147.92	18 04 31.4 684.3	10	4 09 58.07 152.03	24 26 47.2 245.0
11	2 11 43.35 148.11	18 15 55.7 676.5	11	4 12 30.10 151.98	24 30 52.2 235.1
12	2 14 11.46 148.28	18 27 12.2 668.7	12	4 15 02.08 151.92	24 34 47.3 225.2
13	2 16 39.74 148.46	18 38 20.9 660.6	13	4 17 34.00 151.86	24 38 32.5 215.4
14	2 19 08.20 148.64	18 49 21.5 652.7	14	4 20 05.86 151.77	24 42 07.9 205.5
15	2 21 36.84 148.81	19 00 14.2 644.5	15	4 22 37.63 151.70	24 45 33.4 195.6
16	2 24 05.65 148.98	19 10 58.7 636.3	16	4 25 09.33 151.61	24 48 49.0 185.8
17	2 26 34.63 149.15	19 21 35.0 628.1	17	4 27 40.94 151.52	24 51 54.8 176.0
18	2 29 03.78 149.31	19 32 03.1 619.8	18	4 30 12.46 151.41	24 54 50.8 166.2
19	2 31 33.09 149.47	19 42 22.9 611.3	19	4 32 43.87 151.30	24 57 37.0 156.3
20	2 34 02.56 149.62	19 52 34.2 602.9	20	4 35 15.17 151.19	25 00 13.3 146.5
21	2 36 32.18 149.78	20 02 37.1 594.4	21	4 37 46.36 151.07	25 02 39.8 136.8
22	2 39 01.96 149.93	20 12 31.5 585.7	22	4 40 17.43 150.94	25 04 56.6 127.0
23	2 41 31.89 150.08	20 22 17.2 +577.0	23	4 42 48.37 150.81	25 07 03.6 +117.2
24	2 44 01.97	+20 31 54.2	24	4 45 19.18	+25 09 00.8

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Wednesday, October 16							Friday, October 18						
0	h	m	s	°	'	"	0	h	m	s	°	'	"
1	4 45	19.18	150.67	+25	09	00.8	1	6 41	26.45	137.66	+23	44	34.6
2	4 47	49.85	150.51	25	10	48.3	2	6 43	44.11	137.32	23	39	27.6
3	4 50	20.36	150.36	25	12	26.2	3	6 46	01.43	136.95	23	34	13.4
4	4 52	50.72	150.20	25	13	54.4	4	6 48	18.38	136.59	23	28	52.2
5	4 55	20.92	150.03	25	15	12.9	5	6 50	34.97	136.23	23	23	23.8
6	4 57	50.95	149.86	25	16	21.8	6	6 52	51.20	135.88	23	17	48.5
7	5 00	20.81	149.68	25	17	21.2	7	6 55	07.08	135.51	23	12	06.2
8	5 02	50.49	149.49	25	18	11.0	8	6 57	22.59	135.15	23	06	17.1
9	5 05	19.98	149.30	25	18	51.3	9	6 59	37.74	134.79	23	00	21.2
10	5 07	49.28	149.10	25	19	22.1	10	7 01	52.53	134.43	22	54	18.6
11	5 10	18.38	148.89	25	19	43.5	11	7 04	06.96	134.05	22	48	09.3
12	5 12	47.27	148.69	25	19	55.4	12	7 06	21.01	133.70	22	41	53.5
13	5 15	15.96	148.47	25	19	58.0	13	7 08	34.71	133.33	22	35	31.1
14	5 17	44.43	148.25	25	19	51.3	14	7 10	48.04	132.97	22	29	02.3
15	5 20	12.68	148.01	25	19	35.3	15	7 13	01.01	132.60	22	22	27.1
16	5 22	40.69	147.79	25	19	10.0	16	7 15	13.61	132.24	22	15	45.6
17	5 25	08.48	147.54	25	18	35.6	17	7 17	25.85	131.88	22	08	57.8
18	5 27	36.02	147.30	25	17	52.0	18	7 19	37.73	131.51	22	02	03.9
19	5 30	03.32	147.05	25	16	59.3	19	7 21	49.24	131.15	21	55	03.8
20	5 32	30.37	146.80	25	15	57.6	20	7 24	00.39	130.78	21	47	57.7
21	5 34	57.17	146.54	25	14	46.8	21	7 26	11.17	130.42	21	40	45.6
22	5 37	23.71	146.27	25	13	27.1	22	7 28	21.59	130.06	21	33	27.6
23	5 39	49.98	146.00	25	11	58.5	23	7 30	31.65	129.70	21	26	03.8
	5 42	15.98	145.73	+25	10	21.0		7 32	41.35	129.34	+21	18	34.2
Thursday, October 17							Saturday, October 19						
0	5 44	41.71	145.45	+25	08	34.7	0	7 34	50.69	128.98	+21	10	58.8
1	5 47	07.16	145.16	25	06	39.7	1	7 36	59.67	128.62	21	03	17.8
2	5 49	32.32	144.88	25	04	36.0	2	7 39	08.29	128.27	20	55	31.2
3	5 51	57.20	144.58	25	02	23.6	3	7 41	16.56	127.91	20	47	39.2
4	5 54	21.78	144.28	25	00	02.7	4	7 43	24.47	127.55	20	39	41.6
5	5 56	46.06	143.99	24	57	33.2	5	7 45	32.02	127.21	20	31	38.7
6	5 59	10.05	143.68	24	54	55.3	6	7 47	39.23	126.85	20	23	30.4
7	6 01	33.73	143.37	24	52	08.9	7	7 49	46.08	126.50	20	15	16.9
8	6 03	57.10	143.06	24	49	14.3	8	7 51	52.58	126.15	20	06	58.2
9	6 06	20.16	142.74	24	46	11.3	9	7 53	58.73	125.81	19	58	34.4
10	6 08	42.90	142.43	24	43	00.1	10	7 56	04.54	125.46	19	50	05.5
11	6 11	05.33	142.10	24	39	40.7	11	7 58	10.00	125.12	19	41	31.6
12	6 13	27.43	141.78	24	36	13.2	12	8 00	15.12	124.78	19	32	52.7
13	6 15	49.21	141.44	24	32	37.7	13	8 02	19.90	124.44	19	24	09.0
14	6 18	10.65	141.12	24	28	54.2	14	8 04	24.34	124.11	19	15	20.4
15	6 20	31.77	140.78	24	25	02.8	15	8 06	28.45	123.77	19	06	27.1
16	6 22	52.55	140.44	24	21	03.5	16	8 08	32.22	123.44	18	57	29.1
17	6 25	12.99	140.10	24	16	56.5	17	8 10	35.66	123.10	18	48	26.4
18	6 27	33.09	139.76	24	12	41.7	18	8 12	38.76	122.78	18	39	19.2
19	6 29	52.85	139.42	24	08	19.3	19	8 14	41.54	122.46	18	30	07.4
20	6 32	12.27	139.07	24	03	49.3	20	8 16	44.00	122.13	18	20	51.2
21	6 34	31.34	138.72	23	59	11.8	21	8 18	46.13	121.82	18	11	30.6
22	6 36	50.06	138.37	23	54	26.7	22	8 20	47.95	121.49	18	02	05.6
23	6 39	08.43	138.02	23	49	34.3	23	8 22	49.44	121.18	17	52	36.4
24	6 41	26.45		+23	44	34.6	24	8 24	50.62		+17	43	02.9

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Sunday, October 20			Tuesday, October 22		
0	^h 8 ^m 24 ^s 50.62 ^a 120.87	+17 43 02.9	0	^h 9 ^m 56 ^s 37.62 ^a 109.68	+ 8 58 47.2
1	8 26 51.49 120.87	17 33 25.3	1	9 58 27.30 109.68	8 46 49.9
2	8 28 52.04 120.55	17 23 43.5	2	10 00 16.84 109.54	8 34 50.7
3	8 30 52.29 120.25	17 13 57.7	3	10 02 06.24 109.40	8 22 49.9
4	8 32 52.24 119.95	17 04 08.0	4	10 03 55.50 109.26	8 10 47.3
5	8 34 51.89 119.65	16 54 14.2	5	10 05 44.62 109.12	7 58 43.1
6	8 36 51.23 119.34	16 44 16.6	6	10 07 33.62 109.00	7 46 37.2
7	8 38 50.29 119.06	16 34 15.1	7	10 09 22.50 108.88	7 34 29.8
8	8 40 49.05 118.76	16 24 09.9	8	10 11 11.25 108.75	7 22 20.9
9	8 42 47.52 118.47	16 14 01.0	9	10 12 59.88 108.63	7 10 10.4
10	8 44 45.70 118.18	16 03 48.3	10	10 14 48.39 108.51	6 57 58.5
11	8 46 43.60 117.90	15 53 32.1	11	10 16 36.80 108.41	6 45 45.2
12	8 48 41.22 117.62	15 43 12.3	12	10 18 25.09 108.29	6 33 30.5
13	8 50 38.57 117.35	15 32 49.0	13	10 20 13.28 108.19	6 21 14.5
14	8 52 35.64 117.07	15 22 22.2	14	10 22 01.38 108.10	6 08 57.2
15	8 54 32.44 116.80	15 11 52.1	15	10 23 49.38 108.00	5 56 38.6
16	8 56 28.97 116.53	15 01 18.5	16	10 25 37.28 107.90	5 44 18.8
17	8 58 25.24 116.27	14 50 41.7	17	10 27 25.10 107.82	5 31 57.8
18	9 00 21.24 116.00	14 40 01.7	18	10 29 12.84 107.74	5 19 35.7
19	9 02 16.99 115.75	14 29 18.4	19	10 31 00.49 107.65	5 07 12.5
20	9 04 12.49 115.50	14 18 32.0	20	10 32 48.07 107.58	4 54 48.3
21	9 06 07.73 115.24	14 07 42.5	21	10 34 35.58 107.51	4 42 23.1
22	9 08 02.73 115.00	13 56 49.9	22	10 36 23.01 107.43	4 29 56.8
23	9 09 57.49 114.76	+13 45 54.3	23	10 38 10.38 107.37	+ 4 17 29.7
	114.51	-658.5		107.31	-748.1
Monday, October 21			Wednesday, October 23		
0	9 11 52.00 114.28	+13 34 55.8	0	10 39 57.69 107.25	+ 4 05 01.6
1	9 13 46.28 114.04	13 23 54.4	1	10 41 44.94 107.20	3 52 32.7
2	9 15 40.32 113.82	13 12 50.1	2	10 43 32.14 107.15	3 40 03.0
3	9 17 34.14 113.59	13 01 43.0	3	10 45 19.29 107.10	3 27 32.5
4	9 19 27.73 113.37	12 50 33.2	4	10 47 06.39 107.06	3 15 01.2
5	9 21 21.10 113.15	12 39 20.6	5	10 48 53.45 107.02	3 02 29.2
6	9 23 14.25 112.93	12 28 05.4	6	10 50 40.47 106.99	2 49 56.6
7	9 25 07.18 112.72	12 16 47.5	7	10 52 27.46 106.95	2 37 23.3
8	9 26 59.90 112.51	12 05 27.1	8	10 54 14.41 106.93	2 24 49.5
9	9 28 52.41 112.31	11 54 04.2	9	10 56 01.34 106.90	2 12 15.2
10	9 30 44.72 112.11	11 42 38.7	10	10 57 48.24 106.88	1 59 40.3
11	9 32 36.83 111.91	11 31 10.9	11	10 59 35.12 106.87	1 47 05.0
12	9 34 28.74 111.72	11 19 40.6	12	11 01 21.99 106.86	1 34 29.2
13	9 36 20.46 111.52	11 08 08.0	13	11 03 08.85 106.84	1 21 53.1
14	9 38 11.98 111.34	10 56 33.1	14	11 04 55.69 106.84	1 09 16.6
15	9 40 03.32 111.16	10 44 56.0	15	11 06 42.53 106.84	0 56 39.8
16	9 41 54.48 110.98	10 33 16.6	16	11 08 29.37 106.85	0 44 02.7
17	9 43 45.46 110.80	10 21 35.1	17	11 10 16.22 106.85	0 31 25.5
18	9 45 36.26 110.63	10 09 51.4	18	11 12 03.07 106.85	0 18 48.0
19	9 47 26.89 110.47	9 58 05.7	19	11 13 49.92 106.85	+ 0 06 10.4
20	9 49 17.36 110.30	9 46 17.9	20	11 15 36.80 106.88	- 0 06 27.4
21	9 51 07.66 110.14	9 34 28.1	21	11 17 23.69 106.89	0 19 05.2
22	9 52 57.80 109.99	9 22 36.4	22	11 19 10.60 106.91	0 31 43.0
23	9 54 47.79 109.83	9 10 42.7	23	11 20 57.54 106.94	0 44 20.8
24	9 56 37.62	+ 8 58 47.2	24	11 22 44.50 106.96	- 0 56 58.5

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Thursday, October 24					Saturday, October 26				
0	11 22 44.50	107.00	0 56 58.5	757.7	0	12 50 02.80	112.70	10 48 16.3	702.1
1	11 24 31.50	107.03	1 09 36.2	757.5	1	12 51 55.50	112.90	10 59 58.4	699.8
2	11 26 18.53	107.08	1 22 13.7	757.3	2	12 53 48.40	113.11	11 11 38.2	697.4
3	11 28 05.61	107.11	1 34 51.0	757.2	3	12 55 41.51	113.31	11 23 15.6	695.0
4	11 29 52.72	107.17	1 47 28.2	756.8	4	12 57 34.82	113.52	11 34 50.6	692.6
5	11 31 39.89	107.21	2 00 05.0	756.6	5	12 59 28.34	113.73	11 46 23.2	690.0
6	11 33 27.10	107.27	2 12 41.6	756.2	6	13 01 22.07	113.95	11 57 53.2	687.5
7	11 35 14.37	107.32	2 25 17.8	755.9	7	13 03 16.02	114.16	12 09 20.7	684.8
8	11 37 01.69	107.39	2 37 53.7	755.4	8	13 05 10.18	114.39	12 20 45.5	682.1
9	11 38 49.08	107.45	2 50 29.1	755.0	9	13 07 04.57	114.60	12 32 07.6	679.4
10	11 40 36.53	107.53	3 03 04.1	754.5	10	13 08 59.17	114.84	12 43 27.0	676.7
11	11 42 24.06	107.59	3 15 38.6	753.9	11	13 10 54.01	115.06	12 54 43.7	673.8
12	11 44 11.65	107.67	3 28 12.5	753.3	12	13 12 49.07	115.29	13 05 57.5	670.9
13	11 45 59.32	107.75	3 40 45.8	752.7	13	13 14 44.36	115.53	13 17 08.4	668.0
14	11 47 47.07	107.83	3 53 18.5	752.0	14	13 16 39.89	115.76	13 28 16.4	664.9
15	11 49 34.90	107.93	4 05 50.5	751.3	15	13 18 35.65	116.00	13 39 21.3	661.9
16	11 51 22.83	108.01	4 18 21.8	750.6	16	13 20 31.65	116.24	13 50 23.2	658.7
17	11 53 10.84	108.10	4 30 52.4	749.7	17	13 22 27.89	116.49	14 01 21.9	655.6
18	11 54 58.94	108.20	4 43 22.1	748.9	18	13 24 24.38	116.73	14 12 17.5	652.4
19	11 56 47.14	108.30	4 55 51.0	748.0	19	13 26 21.11	116.98	14 23 09.9	649.0
20	11 58 35.44	108.41	5 08 19.0	747.0	20	13 28 18.09	117.23	14 33 58.9	645.8
21	12 00 23.85	108.51	5 20 46.0	746.1	21	13 30 15.32	117.48	14 44 44.7	642.3
22	12 02 12.36	108.63	5 33 12.1	745.0	22	13 32 12.80	117.74	14 55 27.0	638.9
23	12 04 00.99	108.74	5 45 37.1	744.0	23	13 34 10.54	117.99	15 06 05.9	635.4
Friday, October 25					Sunday, October 27				
0	12 05 49.73	108.86	5 58 01.1	742.9	0	13 36 08.53	118.26	15 16 41.3	631.8
1	12 07 38.59	108.98	6 10 24.0	741.7	1	13 38 06.79	118.51	15 27 13.1	628.2
2	12 09 27.57	109.11	6 22 45.7	740.5	2	13 40 05.30	118.78	15 37 41.3	624.5
3	12 11 16.68	109.24	6 35 06.2	739.3	3	13 42 04.08	119.05	15 48 05.8	620.8
4	12 13 05.92	109.36	6 47 25.5	737.9	4	13 44 03.13	119.32	15 58 26.6	616.9
5	12 14 55.28	109.51	6 59 43.4	736.6	5	13 46 02.45	119.58	16 08 43.5	613.1
6	12 16 44.79	109.64	7 12 00.0	735.3	6	13 48 02.03	119.86	16 18 56.6	609.2
7	12 18 34.43	109.78	7 24 15.3	733.8	7	13 50 01.89	120.13	16 29 05.8	605.2
8	12 20 24.21	109.93	7 36 29.1	732.3	8	13 52 02.02	120.41	16 39 11.0	601.2
9	12 22 14.14	110.08	7 48 41.4	730.8	9	13 54 02.43	120.68	16 49 12.2	597.1
10	12 24 04.22	110.23	8 00 52.2	729.2	10	13 56 03.11	120.96	16 59 09.3	593.0
11	12 25 54.45	110.39	8 13 01.4	727.6	11	13 58 04.07	121.24	17 09 02.3	588.7
12	12 27 44.84	110.55	8 25 09.0	725.9	12	14 00 05.31	121.52	17 18 51.0	584.4
13	12 29 35.39	110.70	8 37 14.9	724.3	13	14 02 06.83	121.81	17 28 35.4	580.1
14	12 31 26.09	110.88	8 49 19.2	722.4	14	14 04 08.64	122.09	17 38 15.5	575.7
15	12 33 16.97	111.04	9 01 21.6	720.7	15	14 06 10.73	122.38	17 47 51.2	571.3
16	12 35 08.01	111.22	9 13 22.3	718.8	16	14 08 13.11	122.66	17 57 22.5	566.7
17	12 36 59.23	111.38	9 25 21.1	716.9	17	14 10 15.77	122.95	18 06 49.2	562.2
18	12 38 50.61	111.57	9 37 18.0	714.9	18	14 12 18.72	123.24	18 16 11.4	557.6
19	12 40 42.18	111.75	9 49 12.9	712.9	19	14 14 21.96	123.54	18 25 29.0	552.8
20	12 42 33.93	111.93	10 01 05.8	710.8	20	14 16 25.50	123.82	18 34 41.8	548.1
21	12 44 25.86	112.12	10 12 56.6	708.8	21	14 18 29.32	124.12	18 43 49.9	543.3
22	12 46 17.98	112.31	10 24 45.4	706.5	22	14 20 33.44	124.41	18 52 53.2	538.3
23	12 48 10.29	112.51	10 36 31.9	704.4	23	14 22 37.85	124.70	19 01 51.5	533.5
24	12 50 02.80		10 48 16.3		24	14 24 42.55		19 10 45.0	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Monday, October 28			Wednesday, October 30		
0	14 24 42.55 ^{h m s} 125.00	-19 10 45.0 [°] -528.4	0	16 10 07.83 ^{h m s} 138.25	-24 21 03.7 [°] -219.1
1	14 26 47.55 ^{h m s} 125.29	19 19 33.4 [°] 523.4	1	16 12 26.08 ^{h m s} 138.46	24 24 42.8 [°] 211.4
2	14 28 52.84 ^{h m s} 125.59	19 28 16.8 [°] 518.3	2	16 14 44.54 ^{h m s} 138.68	24 28 14.2 [°] 203.6
3	14 30 58.43 ^{h m s} 125.89	19 36 55.1 [°] 513.0	3	16 17 03.22 ^{h m s} 138.89	24 31 37.8 [°] 195.7
4	14 33 04.32 ^{h m s} 126.18	19 45 28.1 [°] 507.9	4	16 19 22.11 ^{h m s} 139.10	24 34 53.5 [°] 187.9
5	14 35 10.50 ^{h m s} 126.48	19 53 56.0 [°] 502.5	5	16 21 41.21 ^{h m s} 139.30	24 38 01.4 [°] 180.0
6	14 37 16.98 ^{h m s} 126.77	20 02 18.5 [°] 497.1	6	16 24 00.51 ^{h m s} 139.50	24 41 01.4 [°] 172.0
7	14 39 23.75 ^{h m s} 127.07	20 10 35.6 [°] 491.7	7	16 26 20.01 ^{h m s} 139.70	24 43 53.4 [°] 164.0
8	14 41 30.82 ^{h m s} 127.37	20 18 47.3 [°] 486.3	8	16 28 39.71 ^{h m s} 139.89	24 46 37.4 [°] 156.0
9	14 43 38.19 ^{h m s} 127.67	20 26 53.6 [°] 480.6	9	16 30 59.60 ^{h m s} 140.08	24 49 13.4 [°] 148.0
10	14 45 45.86 ^{h m s} 127.97	20 34 54.2 [°] 475.1	10	16 33 19.68 ^{h m s} 140.25	24 51 41.4 [°] 139.8
11	14 47 53.83 ^{h m s} 128.26	20 42 49.3 [°] 469.4	11	16 35 39.93 ^{h m s} 140.44	24 54 01.2 [°] 131.7
12	14 50 02.09 ^{h m s} 128.56	20 50 38.7 [°] 463.6	12	16 38 00.37 ^{h m s} 140.61	24 56 12.9 [°] 123.5
13	14 52 10.65 ^{h m s} 128.85	20 58 22.3 [°] 457.9	13	16 40 20.98 ^{h m s} 140.78	24 58 16.4 [°] 115.3
14	14 54 19.50 ^{h m s} 129.16	21 06 00.2 [°] 452.0	14	16 42 41.76 ^{h m s} 140.94	25 00 11.7 [°] 107.1
15	14 56 28.66 ^{h m s} 129.44	21 13 32.2 [°] 446.1	15	16 45 02.70 ^{h m s} 141.10	25 01 58.8 [°] 98.8
16	14 58 38.10 ^{h m s} 129.74	21 20 58.3 [°] 440.1	16	16 47 23.80 ^{h m s} 141.25	25 03 37.6 [°] 90.5
17	15 00 47.84 ^{h m s} 130.04	21 28 18.4 [°] 434.1	17	16 49 45.05 ^{h m s} 141.40	25 05 08.1 [°] 82.2
18	15 02 57.88 ^{h m s} 130.32	21 35 32.5 [°] 428.0	18	16 52 06.45 ^{h m s} 141.55	25 06 30.3 [°] 73.8
19	15 05 08.20 ^{h m s} 130.62	21 42 40.5 [°] 421.8	19	16 54 28.00 ^{h m s} 141.68	25 07 44.1 [°] 65.5
20	15 07 18.82 ^{h m s} 130.91	21 49 42.3 [°] 415.6	20	16 56 49.68 ^{h m s} 141.82	25 08 49.6 [°] 57.0
21	15 09 29.73 ^{h m s} 131.20	21 56 37.9 [°] 409.4	21	16 59 11.50 ^{h m s} 141.95	25 09 46.6 [°] 48.6
22	15 11 40.93 ^{h m s} 131.49	22 03 27.3 [°] 403.0	22	17 01 33.45 ^{h m s} 142.08	25 10 35.2 [°] 40.1
23	15 13 52.42 ^{h m s} 131.78	-22 10 10.3 [°] -396.6	23	17 03 55.53 ^{h m s} 142.19	-25 11 15.3 [°] -31.6
Tuesday, October 29			Thursday, October 31		
0	15 16 04.20 ^{h m s} 132.06	-22 16 46.9 [°] -390.2	0	17 06 17.72 ^{h m s} 142.31	-25 11 46.9 [°] -23.1
1	15 18 16.26 ^{h m s} 132.35	22 23 17.1 [°] 383.7	1	17 08 40.03 ^{h m s} 142.42	25 12 10.0 [°] 14.6
2	15 20 28.61 ^{h m s} 132.63	22 29 40.8 [°] 377.1	2	17 11 02.45 ^{h m s} 142.52	25 12 24.6 [°] 6.1
3	15 22 41.24 ^{h m s} 132.91	22 35 57.9 [°] 370.4	3	17 13 24.97 ^{h m s} 142.62	25 12 30.7 [°] 2.5
4	15 24 54.15 ^{h m s} 133.19	22 42 08.3 [°] 363.8	4	17 15 47.59 ^{h m s} 142.71	25 12 28.2 [°] 11.1
5	15 27 07.34 ^{h m s} 133.46	22 48 12.1 [°] 357.1	5	17 18 10.30 ^{h m s} 142.80	25 12 17.1 [°] 19.7
6	15 29 20.80 ^{h m s} 133.74	22 54 09.2 [°] 350.3	6	17 20 33.10 ^{h m s} 142.89	25 11 57.4 [°] 28.3
7	15 31 34.54 ^{h m s} 134.01	22 59 59.5 [°] 343.4	7	17 22 55.99 ^{h m s} 142.96	25 11 29.1 [°] 36.9
8	15 33 48.55 ^{h m s} 134.29	23 05 42.9 [°] 336.5	8	17 25 18.95 ^{h m s} 143.03	25 10 52.2 [°] 45.5
9	15 36 02.84 ^{h m s} 134.55	23 11 19.4 [°] 329.6	9	17 27 41.98 ^{h m s} 143.11	25 10 06.7 [°] 54.2
10	15 38 17.39 ^{h m s} 134.82	23 16 49.0 [°] 322.6	10	17 30 05.09 ^{h m s} 143.16	25 09 12.5 [°] 62.9
11	15 40 32.21 ^{h m s} 135.08	23 22 11.6 [°] 315.5	11	17 32 28.25 ^{h m s} 143.22	25 08 09.6 [°] 71.5
12	15 42 47.29 ^{h m s} 135.34	23 27 27.1 [°] 308.4	12	17 34 51.47 ^{h m s} 143.27	25 06 58.1 [°] 80.2
13	15 45 02.63 ^{h m s} 135.61	23 32 35.5 [°] 301.2	13	17 37 14.74 ^{h m s} 143.32	25 05 37.9 [°] 88.8
14	15 47 18.24 ^{h m s} 135.86	23 37 36.7 [°] 294.0	14	17 39 38.06 ^{h m s} 143.35	25 04 09.1 [°] 97.6
15	15 49 34.10 ^{h m s} 136.11	23 42 30.7 [°] 286.7	15	17 42 01.41 ^{h m s} 143.40	25 02 31.5 [°] 106.2
16	15 51 50.21 ^{h m s} 136.36	23 47 17.4 [°] 279.4	16	17 44 24.81 ^{h m s} 143.42	25 00 45.3 [°] 115.0
17	15 54 06.57 ^{h m s} 136.61	23 51 56.8 [°] 272.1	17	17 46 48.23 ^{h m s} 143.45	24 58 50.3 [°] 123.6
18	15 56 23.18 ^{h m s} 136.85	23 56 28.9 [°] 264.6	18	17 49 11.68 ^{h m s} 143.47	24 56 46.7 [°] 132.3
19	15 58 40.03 ^{h m s} 137.09	24 00 53.5 [°] 257.2	19	17 51 35.15 ^{h m s} 143.48	24 54 34.4 [°] 141.0
20	16 00 57.12 ^{h m s} 137.33	24 05 10.7 [°] 249.6	20	17 53 58.63 ^{h m s} 143.49	24 52 13.4 [°] 149.7
21	16 03 14.45 ^{h m s} 137.57	24 09 20.3 [°] 242.1	21	17 56 22.12 ^{h m s} 143.50	24 49 43.7 [°] 158.4
22	16 05 32.02 ^{h m s} 137.79	24 13 32.4 [°] 234.5	22	17 58 45.62 ^{h m s} 143.50	24 47 05.3 [°] 167.1
23	16 07 49.81 ^{h m s} 138.02	24 17 16.9 [°] 226.8	23	18 01 09.12 ^{h m s} 143.49	24 44 18.2 [°] +175.8
24	16 10 07.83 ^{h m s}	-24 21 03.7 [°]	24	18 03 32.61 ^{h m s}	-24 41 22.4 [°]

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Friday, November 1					Sunday, November 3				
0	^h 18 ^m 03 ^s 32.61	143.48	[°] -24 ['] 41 ["] 22.4	+184.4	0	^h 19 ^m 56 ^s 51.88	138.56	[°] -19 ['] 37 ["] 12.8	+571.2
1	18 05 56.09	143.46	24 38 18.0	193.1	1	19 59 10.44	138.39	19 27 41.6	578.2
2	18 08 19.55	143.45	24 35 04.9	201.8	2	20 01 28.83	138.24	19 18 03.4	585.3
3	18 10 43.00	143.42	24 31 43.1	210.4	3	20 03 47.07	138.09	19 08 18.1	592.2
4	18 13 06.42	143.39	24 28 12.7	219.0	4	20 06 05.16	137.92	18 58 25.9	599.1
5	18 15 29.81	143.35	24 24 33.7	227.7	5	20 08 23.08	137.76	18 48 26.8	606.0
6	18 17 53.16	143.32	24 20 46.0	236.2	6	20 10 40.84	137.61	18 38 20.8	612.7
7	18 20 16.48	143.27	24 16 49.8	244.8	7	20 12 58.45	137.45	18 28 08.1	619.4
8	18 22 39.75	143.22	24 12 45.0	253.4	8	20 15 15.90	137.29	18 17 48.7	626.1
9	18 25 02.97	143.17	24 08 31.6	262.0	9	20 17 33.19	137.14	18 07 22.6	632.7
10	18 27 26.14	143.12	24 04 09.6	270.5	10	20 19 50.33	136.97	17 56 49.9	639.3
11	18 29 49.26	143.05	23 59 39.1	279.0	11	20 22 07.30	136.82	17 46 10.6	645.7
12	18 32 12.31	142.99	23 55 00.1	287.5	12	20 24 24.12	136.66	17 35 24.9	652.2
13	18 34 35.30	142.92	23 50 12.6	296.0	13	20 26 40.78	136.51	17 24 32.7	658.5
14	18 36 58.22	142.84	23 45 16.6	304.4	14	20 28 57.29	136.35	17 13 34.2	664.9
15	18 39 21.06	142.76	23 40 12.2	312.9	15	20 31 13.64	136.20	17 02 29.3	671.1
16	18 41 43.82	142.68	23 34 59.3	321.3	16	20 33 29.84	136.04	16 51 18.2	677.3
17	18 44 06.50	142.60	23 29 38.0	329.7	17	20 35 45.88	135.89	16 40 00.9	683.4
18	18 46 29.10	142.51	23 24 08.3	338.0	18	20 38 01.77	135.74	16 28 37.5	689.5
19	18 48 51.61	142.42	23 18 30.3	346.3	19	20 40 17.51	135.59	16 17 08.0	695.4
20	18 51 14.03	142.31	23 12 44.0	354.6	20	20 42 33.10	135.44	16 05 32.6	701.4
21	18 53 36.34	142.22	23 06 49.4	362.9	21	20 44 48.54	135.29	15 53 51.2	707.3
22	18 55 58.56	142.11	23 00 46.5	371.1	22	20 47 03.83	135.15	15 42 03.9	713.1
23	18 58 20.67	142.01	-22 54 35.4	+379.3	23	20 49 18.98	135.00	-15 30 10.8	+718.8
Saturday, November 2					Monday, November 4				
0	19 00 42.68	141.90	-22 48 16.1	+387.5	0	20 51 33.98	134.86	-15 18 12.0	+724.5
1	19 03 04.58	141.78	22 41 48.6	395.6	1	20 53 48.84	134.72	15 06 07.5	730.1
2	19 05 26.36	141.66	22 35 13.0	403.7	2	20 56 03.56	134.57	14 53 57.4	735.6
3	19 07 48.02	141.55	22 28 29.3	411.8	3	20 58 18.13	134.44	14 41 41.8	741.1
4	19 10 09.57	141.42	22 21 37.5	419.7	4	21 00 32.57	134.31	14 29 20.7	746.5
5	19 12 30.99	141.30	22 14 37.8	427.8	5	21 02 46.88	134.17	14 16 54.2	751.9
6	19 14 52.29	141.18	22 07 30.0	435.7	6	21 05 01.05	134.04	14 04 22.3	757.1
7	19 17 13.47	141.04	22 00 14.3	443.6	7	21 07 15.09	133.91	13 51 45.2	762.3
8	19 19 34.51	140.91	21 52 50.7	451.5	8	21 09 29.00	133.78	13 39 02.9	767.5
9	19 21 55.42	140.77	21 45 19.2	459.3	9	21 11 42.78	133.66	13 26 15.4	772.5
10	19 24 16.19	140.64	21 37 39.9	467.1	10	21 13 56.44	133.53	13 13 22.9	777.5
11	19 26 36.83	140.50	21 29 52.8	474.9	11	21 16 09.97	133.41	13 00 25.4	782.4
12	19 28 57.33	140.36	21 21 57.9	482.5	12	21 18 23.38	133.30	12 47 23.0	787.2
13	19 31 17.69	140.22	21 13 55.4	490.2	13	21 20 36.68	133.18	12 34 15.8	792.1
14	19 33 37.91	140.07	21 05 45.2	497.8	14	21 22 49.86	133.07	12 21 03.7	796.7
15	19 35 57.98	139.92	20 57 27.4	505.4	15	21 25 02.93	132.96	12 07 47.0	801.4
16	19 38 17.90	139.78	20 49 02.0	512.9	16	21 27 15.89	132.85	11 54 25.6	805.9
17	19 40 37.68	139.63	20 40 29.1	520.3	17	21 29 28.74	132.75	11 40 59.7	810.4
18	19 42 57.31	139.47	20 31 48.8	527.8	18	21 31 41.49	132.65	11 27 29.3	814.9
19	19 45 16.78	139.33	20 23 01.0	535.1	19	21 33 54.14	132.55	11 13 54.4	819.1
20	19 47 36.11	139.17	20 14 05.9	542.4	20	21 36 06.69	132.45	11 00 15.3	823.5
21	19 49 55.28	139.02	20 05 03.5	549.7	21	21 38 19.14	132.36	10 46 31.8	827.6
22	19 52 14.30	138.87	19 55 53.8	556.9	22	21 40 31.50	132.27	10 32 44.2	831.7
23	19 54 33.17	138.71	19 46 36.9	564.1	23	21 42 43.77	132.19	10 18 52.5	+835.8
24	19 56 51.88		-19 37 12.8		24	21 44 55.96		-10 04 56.7	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Tuesday, November 5			Thursday, November 7		
0	^{h m s} 21 44 55.96 ^s 132.11	^{° ′ ″} -10 04 56.7 [″] +839.7	0	^{h m s} 23 30 12.36 ^s 132.63	^{° ′ ″} + 1 56 23.9 [″] +932.3
1	21 47 08.07 ^s 132.02	9 50 57.0 [″] 843.7	1	23 32 24.99 ^s 132.75	2 11 56.2 [″] 931.9
2	21 49 20.09 ^s 131.95	9 36 53.3 [″] 847.4	2	23 34 37.74 ^s 132.86	2 27 28.1 [″] 931.6
3	21 51 32.04 ^s 131.88	9 22 45.9 [″] 851.2	3	23 36 50.60 ^s 132.99	2 42 59.7 [″] 931.0
4	21 53 43.92 ^s 131.81	9 08 34.7 [″] 854.8	4	23 39 03.59 ^s 133.10	2 58 30.7 [″] 930.5
5	21 55 55.73 ^s 131.74	8 54 19.9 [″] 858.4	5	23 41 16.69 ^s 133.24	3 14 01.2 [″] 929.7
6	21 58 07.47 ^s 131.68	8 40 01.5 [″] 861.9	6	23 43 29.93 ^s 133.37	3 29 30.9 [″] 929.0
7	22 00 19.15 ^s 131.62	8 25 39.6 [″] 865.3	7	23 45 43.30 ^s 133.50	3 44 59.9 [″] 928.1
8	22 02 30.77 ^s 131.57	8 11 14.3 [″] 868.7	8	23 47 56.80 ^s 133.64	4 00 28.0 [″] 927.2
9	22 04 42.34 ^s 131.51	7 56 45.6 [″] 871.9	9	23 50 10.44 ^s 133.79	4 15 55.2 [″] 926.0
10	22 06 53.85 ^s 131.47	7 42 13.7 [″] 875.1	10	23 52 24.23 ^s 133.94	4 31 21.2 [″] 924.8
11	22 09 05.32 ^s 131.42	7 27 38.6 [″] 878.2	11	23 54 38.17 ^s 134.09	4 46 46.0 [″] 923.6
12	22 11 16.74 ^s 131.38	7 13 00.4 [″] 881.2	12	23 56 52.26 ^s 134.24	5 02 09.6 [″] 922.2
13	22 13 28.12 ^s 131.35	6 58 19.2 [″] 884.2	13	23 59 06.50 ^s 134.41	5 17 31.8 [″] 920.7
14	22 15 39.47 ^s 131.32	6 43 35.0 [″] 887.0	14	0 01 20.91 ^s 134.57	5 32 52.5 [″] 919.0
15	22 17 50.79 ^s 131.28	6 28 48.0 [″] 889.8	15	0 03 35.48 ^s 134.73	5 48 11.5 [″] 917.4
16	22 20 02.07 ^s 131.26	6 13 58.2 [″] 892.5	16	0 05 50.21 ^s 134.91	6 03 28.9 [″] 915.6
17	22 22 13.33 ^s 131.24	5 59 05.7 [″] 895.1	17	0 08 05.12 ^s 135.08	6 18 44.5 [″] 913.7
18	22 24 24.57 ^s 131.22	5 44 10.6 [″] 897.6	18	0 10 20.20 ^s 135.26	6 33 58.2 [″] 911.6
19	22 26 35.79 ^s 131.21	5 29 13.0 [″] 900.1	19	0 12 35.46 ^s 135.45	6 49 09.8 [″] 909.5
20	22 28 47.00 ^s 131.21	5 14 12.9 [″] 902.4	20	0 14 50.91 ^s 135.62	7 04 19.3 [″] 907.3
21	22 30 58.21 ^s 131.19	4 59 10.5 [″] 904.6	21	0 17 06.53 ^s 135.82	7 19 26.6 [″] 905.0
22	22 33 09.40 ^s 131.20	4 44 05.9 [″] 906.9	22	0 19 22.35 ^s 136.01	7 34 31.6 [″] 902.6
23	22 35 20.60 ^s 131.20	- 4 28 59.0 [″] +909.0	23	0 21 38.36 ^s 136.20	+ 7 49 34.2 [″] +900.0
Wednesday, November 6			Friday, November 8		
0	22 37 31.80 ^s 131.21	- 4 13 50.0 [″] +911.0	0	0 23 54.56 ^s 136.40	+ 8 04 34.2 [″] +897.4
1	22 39 43.01 ^s 131.21	3 58 39.0 [″] 912.9	1	0 26 10.96 ^s 136.61	8 19 31.6 [″] 894.6
2	22 41 54.22 ^s 131.24	3 43 26.1 [″] 914.8	2	0 28 27.57 ^s 136.80	8 34 26.2 [″] 891.8
3	22 44 05.46 ^s 131.25	3 28 11.3 [″] 916.5	3	0 30 44.37 ^s 137.02	8 49 18.0 [″] 888.8
4	22 46 16.71 ^s 131.28	3 12 54.8 [″] 918.1	4	0 33 01.39 ^s 137.23	9 04 06.8 [″] 885.8
5	22 48 27.99 ^s 131.30	2 57 36.7 [″] 919.8	5	0 35 18.62 ^s 137.44	9 18 52.6 [″] 882.5
6	22 50 39.29 ^s 131.34	2 42 16.9 [″] 921.2	6	0 37 36.06 ^s 137.65	9 33 35.1 [″] 879.3
7	22 52 50.63 ^s 131.38	2 26 55.7 [″] 922.6	7	0 39 53.71 ^s 137.88	9 48 14.4 [″] 875.9
8	22 55 02.01 ^s 131.41	2 11 33.1 [″] 923.9	8	0 42 11.59 ^s 138.10	10 02 50.3 [″] 872.4
9	22 57 13.42 ^s 131.46	1 56 09.2 [″] 925.2	9	0 44 29.69 ^s 138.32	10 17 22.7 [″] 868.8
10	22 59 24.88 ^s 131.51	1 40 44.0 [″] 926.2	10	0 46 48.01 ^s 138.55	10 31 51.5 [″] 865.1
11	23 01 36.39 ^s 131.56	1 25 17.8 [″] 927.3	11	0 49 06.56 ^s 138.78	10 46 16.6 [″] 861.2
12	23 03 47.95 ^s 131.62	1 09 50.5 [″] 928.2	12	0 51 25.34 ^s 139.01	11 00 37.8 [″] 857.3
13	23 05 59.57 ^s 131.68	0 54 22.3 [″] 929.1	13	0 53 44.35 ^s 139.25	11 14 55.1 [″] 853.3
14	23 08 11.25 ^s 131.74	0 38 53.2 [″] 929.9	14	0 56 03.60 ^s 139.48	11 29 08.4 [″] 849.2
15	23 10 22.99 ^s 131.82	0 23 23.3 [″] 930.5	15	0 58 23.08 ^s 139.72	11 43 17.6 [″] 844.9
16	23 12 34.81 ^s 131.89	- 0 07 52.8 [″] 931.1	16	1 00 42.80 ^s 139.97	11 57 22.5 [″] 840.6
17	23 14 46.70 ^s 131.97	+ 0 07 38.3 [″] 931.5	17	1 03 02.77 ^s 140.20	12 11 23.1 [″] 836.1
18	23 16 58.67 ^s 132.05	0 23 09.8 [″] 932.0	18	1 05 22.97 ^s 140.45	12 25 19.2 [″] 831.5
19	23 19 10.72 ^s 132.14	0 38 41.8 [″] 932.2	19	1 07 43.42 ^s 140.70	12 39 10.7 [″] 826.9
20	23 21 22.86 ^s 132.23	0 54 14.0 [″] 932.4	20	1 10 04.12 ^s 140.94	12 52 57.6 [″] 822.1
21	23 23 35.09 ^s 132.32	1 09 46.4 [″] 932.6	21	1 12 25.06 ^s 141.19	13 06 39.7 [″] 817.1
22	23 25 47.41 ^s 132.42	1 25 19.0 [″] 932.5	22	1 14 46.25 ^s 141.44	13 20 16.8 [″] 812.2
23	23 27 59.83 ^s 132.53	1 40 51.5 [″] +932.4	23	1 17 07.69 ^s 141.70	13 33 49.0 [″] +807.1
24	23 30 12.36 ^s	+ 1 56 23.9 [″]	24	1 19 29.39 ^s	+13 47 16.1 [″]

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Saturday, November 9							Monday, November 11						
0	^h 19	^m 29.39	^s 141.95	+13	47	16.1	0	^h 3	^m 17	^s 38.66	+22	20	37.3
1	21	51.34	142.20		14	00 38.0	1	20	11.41	152.75		22	27 57.9
2	24	13.54	142.46		14	13 54.6	2	22	44.30	152.89		22	35 09.1
3	26	36.00	142.72		14	27 05.7	3	25	17.32	153.02		22	42 10.9
4	28	58.72	142.97		14	40 11.3	4	27	50.46	153.14		22	49 03.2
5	31	21.69	143.23		14	53 11.3	5	30	23.72	153.26		22	55 45.9
6	33	44.92	143.48		15	06 05.6	6	32	57.09	153.37		23	02 19.0
7	36	08.40	143.74		15	18 54.0	7	35	30.56	153.47		23	08 42.5
8	38	32.14	144.00		15	31 36.5	8	38	04.13	153.57		23	14 56.4
9	40	56.14	144.26		15	44 13.0	9	40	37.79	153.66		23	21 00.5
10	43	20.40	144.52		15	56 43.3	10	43	11.54	153.75		23	26 54.9
11	45	44.92	144.77		16	09 07.4	11	45	45.36	153.82		23	32 39.5
12	48	09.69	145.03		16	21 25.1	12	48	19.25	153.89		23	38 14.3
13	50	34.72	145.29		16	33 36.4	13	50	53.21	153.96		23	43 39.3
14	53	00.01	145.54		16	45 41.1	14	53	27.22	154.01		23	48 54.3
15	55	25.55	145.80		16	57 39.2	15	56	01.27	154.05		23	53 59.5
16	57	51.35	146.05		17	09 30.6	16	58	35.37	154.10		23	58 54.7
17	00	17.40	146.31		17	21 15.1	17	01	09.50	154.13		24	03 40.0
18	02	43.71	146.56		17	32 52.6	18	03	43.66	154.16		24	08 15.4
19	05	10.27	146.81		17	44 23.2	19	06	17.83	154.17		24	12 40.7
20	07	37.08	147.05		17	55 46.6	20	08	52.01	154.18		24	16 56.1
21	10	04.13	147.30		18	07 02.7	21	11	26.20	154.19		24	21 01.5
22	12	31.43	147.55		18	18 11.6	22	14	00.38	154.18		24	24 56.8
23	14	58.98	147.79	+18	29	13.1	23	16	34.55	154.17	+24	28	42.1
						+653.9				154.15			+215.2
Sunday, November 10							Tuesday, November 12						
0	2	17 26.77	148.03	+18	40	07.0	0	4	19 08.70	154.12	+24	32	17.3
1	2	19 54.80	148.27		18	50 53.4	1	4	21 42.82	154.09		24	35 42.5
2	2	22 23.07	148.51		19	01 32.1	2	4	24 16.91	154.03		24	38 57.6
3	2	24 51.58	148.74		19	12 03.0	3	4	26 50.94	153.99		24	42 02.7
4	2	27 20.32	148.97		19	22 26.1	4	4	29 24.93	153.92		24	44 57.7
5	2	29 49.29	149.20		19	32 41.2	5	4	31 58.85	153.86		24	47 42.7
6	2	32 18.49	149.43		19	42 48.4	6	4	34 32.71	153.78		24	50 17.6
7	2	34 47.92	149.64		19	52 47.4	7	4	37 06.49	153.70		24	52 42.5
8	2	37 17.56	149.86		20	02 38.2	8	4	39 40.19	153.60		24	54 57.4
9	2	39 47.42	150.08		20	12 20.8	9	4	42 13.79	153.50		24	57 02.3
10	2	42 17.50	150.29		20	21 55.0	10	4	44 47.29	153.40		24	58 57.2
11	2	44 47.79	150.49		20	31 20.8	11	4	47 20.69	153.28		25	00 42.1
12	2	47 18.28	150.70		20	40 38.1	12	4	49 53.97	153.16		25	02 17.0
13	2	49 48.98	150.89		20	49 46.9	13	4	52 27.13	153.02		25	03 42.0
14	2	52 19.87	151.09		20	58 46.9	14	4	55 00.15	152.88		25	04 57.0
15	2	54 50.96	151.28		21	07 38.3	15	4	57 33.03	152.74		25	06 02.2
16	2	57 22.24	151.46		21	16 20.9	16	5	00 05.77	152.58		25	06 57.4
17	2	59 53.70	151.64		21	24 54.6	17	5	02 38.35	152.43		25	07 42.8
18	3	02 25.34	151.81		21	33 19.4	18	5	05 10.78	152.25		25	08 18.3
19	3	04 57.15	151.99		21	41 35.2	19	5	07 43.03	152.07		25	08 44.1
20	3	07 29.14	152.14		21	49 42.0	20	5	10 15.10	151.89		25	09 00.2
21	3	10 01.28	152.31		21	57 39.6	21	5	12 46.99	151.70		25	09 06.5
22	3	12 33.59	152.46		22	05 28.1	22	5	15 18.69	151.50		25	09 03.1
23	3	15 06.05	152.61		22	13 07.4	23	5	17 50.19	151.29		25	08 50.0
24	3	17 38.66		+22	20	37.3	24	5	20 21.48		+25	08	27.3
						+449.9							- 22.7

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Wednesday, November 13					Friday, November 15				
0	^h 5 ^m 20 ^s 21.48	^s 151.08	+25° 08' 27.3"	- 32.3"	0	^h 7 ^m 15 ^s 32.22	^s 135.11	+22° 00' 02.5"	-421.0"
1	5 22 52.56	150.86	25 07 55.0	41.7	1	7 17 47.33	134.72	21 53 01.5	427.3
2	5 25 23.42	150.63	25 07 13.3	51.3	2	7 20 02.05	134.33	21 45 54.2	433.5
3	5 27 54.05	150.40	25 06 22.0	60.7	3	7 22 16.38	133.93	21 38 40.7	439.8
4	5 30 24.45	150.16	25 05 21.3	70.2	4	7 24 30.31	133.54	21 31 20.9	445.9
5	5 32 54.61	149.91	25 04 11.1	79.4	5	7 26 43.85	133.14	21 23 55.0	452.0
6	5 35 24.52	149.67	25 02 51.7	88.7	6	7 28 56.99	132.76	21 16 23.0	457.9
7	5 37 54.19	149.40	25 01 23.0	98.0	7	7 31 09.75	132.36	21 08 45.1	463.8
8	5 40 23.59	149.13	24 59 45.0	107.2	8	7 33 22.11	131.97	21 01 01.3	469.6
9	5 42 52.72	148.87	24 57 57.8	116.3	9	7 35 34.08	131.58	20 53 11.7	475.3
10	5 45 21.59	148.59	24 56 01.5	125.4	10	7 37 45.66	131.18	20 45 16.4	481.1
11	5 47 50.18	148.30	24 53 56.1	134.5	11	7 39 56.84	130.80	20 37 15.3	486.6
12	5 50 18.48	148.02	24 51 41.6	143.4	12	7 42 07.64	130.41	20 29 08.7	492.2
13	5 52 46.50	147.72	24 49 18.2	152.3	13	7 44 18.05	130.03	20 20 56.5	497.6
14	5 55 14.22	147.42	24 46 45.9	161.2	14	7 46 28.08	129.63	20 12 38.9	503.0
15	5 57 41.64	147.11	24 44 04.7	169.9	15	7 48 37.71	129.26	20 04 15.9	508.3
16	6 00 08.75	146.81	24 41 14.8	178.7	16	7 50 46.97	128.87	19 55 47.6	513.5
17	6 02 35.56	146.49	24 38 16.1	187.3	17	7 52 55.84	128.49	19 47 14.1	518.7
18	6 05 02.05	146.17	24 35 08.8	196.0	18	7 55 04.33	128.11	19 38 35.4	523.7
19	6 07 28.22	145.85	24 31 52.8	204.5	19	7 57 12.44	127.73	19 29 51.7	528.8
20	6 09 54.07	145.52	24 28 28.3	212.9	20	7 59 20.17	127.35	19 21 02.9	533.8
21	6 12 19.59	145.19	24 24 55.4	221.3	21	8 01 27.52	126.98	19 12 09.1	538.6
22	6 14 44.78	144.85	24 21 14.1	229.7	22	8 03 34.50	126.61	19 03 10.5	543.5
23	6 17 09.63	144.51	+24 17 24.4	-238.0	23	8 05 41.11	126.24	+18 54 07.0	-548.2
Thursday, November 14					Saturday, November 16				
0	6 19 34.14	144.16	+24 13 26.4	-246.1	0	8 07 47.35	125.87	+18 44 58.8	-552.9
1	6 21 58.30	143.82	24 09 20.3	254.3	1	8 09 53.22	125.50	18 35 45.9	557.4
2	6 24 22.12	143.46	24 05 06.0	262.4	2	8 11 58.72	125.15	18 26 28.5	562.0
3	6 26 45.58	143.10	24 00 43.6	270.3	3	8 14 03.87	124.78	18 17 06.5	566.5
4	6 29 08.68	142.75	23 56 13.3	278.2	4	8 16 08.65	124.42	18 07 40.0	570.9
5	6 31 31.43	142.39	23 51 35.1	286.1	5	8 18 13.07	124.06	17 58 09.1	575.3
6	6 33 53.82	142.02	23 46 49.0	293.9	6	8 20 17.13	123.71	17 48 33.8	579.5
7	6 36 15.84	141.65	23 41 55.1	301.5	7	8 22 20.84	123.37	17 38 54.3	583.8
8	6 38 37.49	141.29	23 36 53.6	309.2	8	8 24 24.21	123.01	17 29 10.5	587.8
9	6 40 58.78	140.91	23 31 44.4	316.7	9	8 26 27.22	122.67	17 19 22.7	592.0
10	6 43 19.69	140.53	23 26 27.7	324.3	10	8 28 29.89	122.32	17 09 30.7	596.0
11	6 45 40.22	140.16	23 21 03.4	331.6	11	8 30 32.21	121.99	16 59 34.7	599.9
12	6 48 00.38	139.78	23 15 31.8	338.9	12	8 32 34.20	121.65	16 49 34.8	603.8
13	6 50 20.16	139.40	23 09 52.9	346.2	13	8 34 35.85	121.31	16 39 31.0	607.7
14	6 52 39.56	139.01	23 04 06.7	353.4	14	8 36 37.16	120.99	16 29 23.3	611.4
15	6 54 58.57	138.63	22 58 13.3	360.5	15	8 38 38.15	120.66	16 19 11.9	615.1
16	6 57 17.20	138.24	22 52 12.8	367.5	16	8 40 38.81	120.33	16 08 56.8	618.8
17	6 59 35.44	137.85	22 46 05.3	374.4	17	8 42 39.14	120.02	15 58 38.0	622.3
18	7 01 53.29	137.47	22 39 50.9	381.3	18	8 44 39.16	119.69	15 48 15.7	625.9
19	7 04 10.76	137.08	22 33 29.6	388.1	19	8 46 38.85	119.39	15 37 49.8	629.4
20	7 06 27.84	136.68	22 27 01.5	394.9	20	8 48 38.24	119.07	15 27 20.4	632.7
21	7 08 44.52	136.29	22 20 26.6	401.5	21	8 50 37.31	118.76	15 16 47.7	636.1
22	7 11 00.81	135.90	22 13 45.1	408.0	22	8 52 36.07	118.46	15 06 11.6	639.4
23	7 13 16.71	135.51	22 06 57.1	414.6	23	8 54 34.53	118.16	14 55 32.2	642.7
24	7 15 32.22		+22 00 02.5		24	8 56 32.69		+14 44 49.5	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Sunday, November 17					Tuesday, November 19				
0	^h 8 ^m 56 ^s 32.69	117.86	+14 44 49.5	-645.8	0	^h 10 ^m 26 ^s 25.73	108.20	+ 5 23 50.7	-741.1
1	8 58 30.55	117.57	14 34 03.7	649.0	1	10 28 13.93	108.09	5 11 29.6	742.1
2	9 00 28.12	117.28	14 23 14.7	652.0	2	10 30 02.02	108.00	4 59 07.5	743.0
3	9 02 25.40	116.99	14 12 22.7	655.0	3	10 31 50.02	107.91	4 46 44.5	743.8
4	9 04 22.39	116.71	14 01 27.7	658.0	4	10 33 37.93	107.82	4 34 20.7	744.7
5	9 06 19.10	116.43	13 50 29.7	660.9	5	10 35 25.75	107.73	4 21 56.0	745.5
6	9 08 15.53	116.16	13 39 28.8	663.8	6	10 37 13.48	107.65	4 09 30.5	746.2
7	9 10 11.69	115.88	13 28 25.0	666.5	7	10 39 01.13	107.58	3 57 04.3	746.9
8	9 12 07.57	115.62	13 17 18.5	669.3	8	10 40 48.71	107.51	3 44 37.4	747.6
9	9 14 03.19	115.35	13 06 09.2	672.1	9	10 42 36.22	107.43	3 32 09.8	748.3
10	9 15 58.54	115.09	12 54 57.1	674.6	10	10 44 23.65	107.38	3 19 41.5	748.8
11	9 17 53.63	114.84	12 43 42.5	677.3	11	10 46 11.03	107.31	3 07 12.7	749.4
12	9 19 48.47	114.59	12 32 25.2	679.8	12	10 47 58.34	107.26	2 54 43.3	749.9
13	9 21 43.06	114.34	12 21 05.4	682.3	13	10 49 45.60	107.21	2 42 13.4	750.4
14	9 23 37.40	114.09	12 09 43.1	684.8	14	10 51 32.81	107.16	2 29 43.0	750.8
15	9 25 31.49	113.85	11 58 18.3	687.1	15	10 53 19.97	107.12	2 17 12.2	751.3
16	9 27 25.34	113.61	11 46 51.2	689.5	16	10 55 07.09	107.08	2 04 40.9	751.6
17	9 29 18.95	113.38	11 35 21.7	691.7	17	10 56 54.17	107.05	1 52 09.3	752.0
18	9 31 12.33	113.16	11 23 50.0	694.1	18	10 58 41.22	107.02	1 39 37.3	752.2
19	9 33 05.49	112.93	11 12 15.9	696.2	19	11 00 28.24	106.99	1 27 05.1	752.6
20	9 34 58.42	112.70	11 00 39.7	698.4	20	11 02 15.23	106.97	1 14 32.5	752.7
21	9 36 51.12	112.49	10 49 01.3	700.5	21	11 04 02.20	106.95	1 01 59.8	753.0
22	9 38 43.61	112.28	10 37 20.8	702.6	22	11 05 49.15	106.93	0 49 26.8	753.1
23	9 40 35.89	112.07	+10 25 38.2	-704.6	23	11 07 36.08	106.93	+ 0 36 53.7	-753.2
Monday, November 18					Wednesday, November 20				
0	9 42 27.96	111.86	+10 13 53.6	-706.6	0	11 09 23.01	106.92	+ 0 24 20.5	-753.3
1	9 44 19.82	111.67	10 02 07.0	708.5	1	11 11 09.93	106.93	+ 0 11 47.2	753.3
2	9 46 11.49	111.46	9 50 18.5	710.4	2	11 12 56.86	106.92	- 0 00 46.1	753.4
3	9 48 02.95	111.28	9 38 28.1	712.2	3	11 14 43.78	106.93	0 13 19.5	753.3
4	9 49 54.23	111.09	9 26 35.9	714.0	4	11 16 30.71	106.95	0 25 52.8	753.3
5	9 51 45.32	110.90	9 14 41.9	715.8	5	11 18 17.66	106.96	0 38 26.1	753.1
6	9 53 36.22	110.72	9 02 46.1	717.5	6	11 20 04.62	106.97	0 50 59.2	753.1
7	9 55 26.94	110.55	8 50 48.6	719.1	7	11 21 51.59	107.00	1 03 32.3	752.8
8	9 57 17.49	110.37	8 38 49.5	720.8	8	11 23 38.59	107.03	1 16 05.1	752.6
9	9 59 07.86	110.21	8 26 48.7	722.3	9	11 25 25.62	107.06	1 28 37.7	752.4
10	10 00 58.07	110.05	8 14 46.4	723.9	10	11 27 12.68	107.10	1 41 10.1	752.1
11	10 02 48.12	109.88	8 02 42.5	725.4	11	11 28 59.78	107.13	1 53 42.2	751.7
12	10 04 38.00	109.73	7 50 37.1	726.8	12	11 30 46.91	107.18	2 06 13.9	751.4
13	10 06 27.73	109.58	7 38 30.3	728.3	13	11 32 34.09	107.22	2 18 45.3	751.0
14	10 08 17.31	109.43	7 26 22.0	729.6	14	11 34 21.31	107.28	2 31 16.3	750.5
15	10 10 06.74	109.29	7 14 12.4	731.0	15	11 36 08.59	107.33	2 43 46.8	750.1
16	10 11 56.03	109.15	7 02 01.4	732.2	16	11 37 55.92	107.40	2 56 16.9	749.5
17	10 13 45.18	109.02	6 49 49.2	733.5	17	11 39 43.32	107.45	3 08 46.4	749.0
18	10 15 34.20	108.89	6 37 35.7	734.7	18	11 41 30.77	107.53	3 21 15.4	748.4
19	10 17 23.09	108.77	6 25 21.0	735.9	19	11 43 18.30	107.59	3 33 43.8	747.7
20	10 19 11.86	108.64	6 13 05.1	737.0	20	11 45 05.89	107.67	3 46 11.5	747.1
21	10 21 00.50	108.52	6 00 48.1	738.1	21	11 46 53.56	107.75	3 58 38.6	746.5
22	10 22 49.02	108.41	5 48 30.0	739.1	22	11 48 41.31	107.84	4 11 04.9	745.7
23	10 24 37.43	108.30	5 36 10.9	-740.2	23	11 50 29.15	107.92	4 23 30.6	-744.8
24	10 26 25.73		+ 5 23 50.7		24	11 52 17.07		- 4 35 55.4	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Thursday, November 21							Saturday, November 23						
0	11	52	17.07	108.01	-	4 35 55.4	0	13	21	34.63	-14	02 19.2	
1	11	54	05.08	108.11		4 48 19.4	1	13	23	31.39		14 13 11.2	
2	11	55	53.19	108.21		5 00 42.5	2	13	25	28.41		14 24 00.1	
3	11	57	41.40	108.31		5 13 04.7	3	13	27	25.70		14 34 45.8	
4	11	59	29.71	108.42		5 25 26.0	4	13	29	23.26		14 45 28.3	
5	12	01	18.13	108.53		5 37 46.3	5	13	31	21.09		14 56 07.4	
6	12	03	06.66	108.65		5 50 05.5	6	13	33	19.20		15 06 43.2	
7	12	04	55.31	108.76		6 02 23.7	7	13	35	17.58		15 17 15.6	
8	12	06	44.07	108.89		6 14 40.7	8	13	37	16.24		15 27 44.5	
9	12	08	32.96	109.01		6 26 56.6	9	13	39	15.19		15 38 09.8	
10	12	10	21.97	109.14		6 39 11.3	10	13	41	14.42		15 48 31.5	
11	12	12	11.11	109.28		6 51 24.8	11	13	43	13.93		15 58 49.6	
12	12	14	00.39	109.42		7 03 37.0	12	13	45	13.74		16 09 04.0	
13	12	15	49.81	109.56		7 15 47.9	13	13	47	13.84		16 19 14.6	
14	12	17	39.37	109.70		7 27 57.4	14	13	49	14.23		16 29 21.4	
15	12	19	29.07	109.85		7 40 05.5	15	13	51	14.91		16 39 24.2	
16	12	21	18.92	110.01		7 52 12.1	16	13	53	15.90		16 49 23.1	
17	12	23	08.93	110.16		8 04 17.3	17	13	55	17.18		16 59 18.0	
18	12	24	59.09	110.33		8 16 20.9	18	13	57	18.77		17 09 08.8	
19	12	26	49.42	110.49		8 28 22.9	19	13	59	20.66		17 18 55.4	
20	12	28	39.91	110.65		8 40 23.3	20	14	01	22.85		17 28 37.8	
21	12	30	30.56	110.83		8 52 22.0	21	14	03	25.35		17 38 16.0	
22	12	32	21.39	111.01		9 04 18.9	22	14	05	28.17		17 47 49.8	
23	12	34	12.40	111.18	-	9 16 14.2	23	14	07	31.29	-	17 57 19.3	
						-713.4						-565.0	
Friday, November 22							Sunday, November 24						
0	12	36	03.58	111.37	-	9 28 07.6	0	14	09	34.72	-18	06 44.3	
1	12	37	54.95	111.55		9 39 59.1	1	14	11	38.47		18 16 04.8	
2	12	39	46.50	111.74		9 51 48.8	2	14	13	42.53		18 25 20.7	
3	12	41	38.24	111.93		10 03 36.5	3	14	15	46.91		18 34 31.9	
4	12	43	30.17	112.13		10 15 22.2	4	14	17	51.60		18 43 38.5	
5	12	45	22.30	112.33		10 27 05.8	5	14	19	56.62		18 52 40.2	
6	12	47	14.63	112.54		10 38 47.4	6	14	22	01.96		19 01 37.1	
7	12	49	07.17	112.74		10 50 26.8	7	14	24	07.61		19 10 29.2	
8	12	50	59.91	112.95		11 02 04.0	8	14	26	13.59		19 19 16.2	
9	12	52	52.86	113.16		11 13 38.9	9	14	28	19.89		19 27 58.2	
10	12	54	46.02	113.39		11 25 11.6	10	14	30	26.51		19 36 35.2	
11	12	56	39.41	113.60		11 36 41.9	11	14	32	33.46		19 45 06.9	
12	12	58	33.01	113.83		11 48 09.8	12	14	34	40.73		19 53 33.5	
13	13	00	26.84	114.05		11 59 35.3	13	14	36	48.33		20 01 54.7	
14	13	02	20.89	114.29		12 10 58.3	14	14	38	56.25		20 10 10.6	
15	13	04	15.18	114.51		12 22 18.7	15	14	41	04.49		20 18 21.1	
16	13	06	09.69	114.76		12 33 36.5	16	14	43	13.07		20 26 26.1	
17	13	08	04.45	114.99		12 44 51.7	17	14	45	21.97		20 34 25.5	
18	13	09	59.44	115.24		12 56 04.2	18	14	47	31.19		20 42 19.3	
19	13	11	54.68	115.49		13 07 13.9	19	14	49	40.74		20 50 07.4	
20	13	13	50.17	115.73		13 18 20.8	20	14	51	50.61		20 57 49.7	
21	13	15	45.90	115.99		13 29 24.8	21	14	54	00.81		21 05 26.3	
22	13	17	41.89	116.24		13 40 25.9	22	14	56	11.33		21 12 56.9	
23	13	19	38.13	116.50		13 51 24.1	23	14	58	22.18		21 20 21.6	
24	13	21	34.63		-	14 02 19.2	24	15	00	33.35	-	21 27 40.3	
						-655.1						-438.7	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Monday, November 25							Wednesday, November 27						
0	15	00	33.35	131.49	-21	27 40.3	0	16	51	07.94	143.83	-25	00 46.9
1	15	02	44.84	131.81	21	34 52.9	1	16	53	31.77	143.98	25	01 59.2
2	15	04	56.65	132.14	21	41 59.3	2	16	55	55.75	144.12	25	03 02.9
3	15	07	08.79	132.45	21	48 59.6	3	16	58	19.87	144.26	25	03 57.9
4	15	09	21.24	132.77	21	55 53.5	4	17	00	44.13	144.39	25	04 44.2
5	15	11	34.01	133.09	22	02 41.2	5	17	03	08.52	144.51	25	05 21.8
6	15	13	47.10	133.40	22	09 22.4	6	17	05	33.03	144.64	25	05 50.7
7	15	16	00.50	133.71	22	15 57.1	7	17	07	57.67	144.74	25	06 10.8
8	15	18	14.21	134.03	22	22 25.3	8	17	10	22.41	144.85	25	06 22.1
9	15	20	28.24	134.34	22	28 47.0	9	17	12	47.26	144.96	25	06 24.7
10	15	22	42.58	134.65	22	35 01.9	10	17	15	12.22	145.04	25	06 18.4
11	15	24	57.23	134.95	22	41 10.2	11	17	17	37.26	145.14	25	06 03.3
12	15	27	12.18	135.26	22	47 11.6	12	17	20	02.40	145.22	25	05 39.3
13	15	29	27.44	135.56	22	53 06.2	13	17	22	27.62	145.29	25	05 06.5
14	15	31	43.00	135.86	22	58 53.9	14	17	24	52.91	145.37	25	04 24.7
15	15	33	58.86	136.15	23	04 34.7	15	17	27	18.28	145.42	25	03 34.1
16	15	36	15.01	136.45	23	10 08.4	16	17	29	43.70	145.48	25	02 34.6
17	15	38	31.46	136.74	23	15 35.0	17	17	32	09.18	145.53	25	01 26.2
18	15	40	48.20	137.03	23	20 54.4	18	17	34	34.71	145.58	25	00 08.8
19	15	43	05.23	137.32	23	26 06.7	19	17	37	00.29	145.61	24	58 42.5
20	15	45	22.55	137.59	23	31 11.7	20	17	39	25.90	145.65	24	57 07.3
21	15	47	40.14	137.88	23	36 09.4	21	17	41	51.55	145.67	24	55 23.2
22	15	49	58.02	138.15	23	40 59.7	22	17	44	17.22	145.69	24	53 30.2
23	15	52	16.17	138.43	-23	45 42.5	23	17	46	42.91	145.70	-24	51 28.1
Tuesday, November 26							Thursday, November 28						
0	15	54	34.60	138.70	-23	50 17.9	0	17	49	08.61	145.71	-24	49 17.2
1	15	56	53.30	138.96	23	54 45.7	1	17	51	34.32	145.71	24	46 57.3
2	15	59	12.26	139.22	23	59 05.9	2	17	54	00.03	145.71	24	44 28.5
3	16	01	31.48	139.48	24	03 18.4	3	17	56	25.74	145.71	24	41 50.8
4	16	03	50.96	139.74	24	07 23.3	4	17	58	51.43	145.69	24	39 04.2
5	16	06	10.70	139.99	24	11 20.3	5	18	01	17.11	145.68	24	36 08.6
6	16	08	30.69	140.23	24	15 09.5	6	18	03	42.76	145.65	24	33 04.2
7	16	10	50.92	140.47	24	18 50.9	7	18	06	08.38	145.62	24	29 50.9
8	16	13	11.39	140.71	24	22 24.4	8	18	08	33.97	145.59	24	26 28.7
9	16	15	32.10	140.94	24	25 49.9	9	18	10	59.52	145.55	24	22 57.7
10	16	17	53.04	141.18	24	29 07.4	10	18	13	25.02	145.50	24	19 17.9
11	16	20	14.22	141.39	24	32 16.9	11	18	15	50.47	145.45	24	15 29.2
12	16	22	35.61	141.62	24	35 18.2	12	18	18	15.86	145.39	24	11 31.7
13	16	24	57.23	141.82	24	38 11.4	13	18	20	41.19	145.33	24	07 25.5
14	16	27	19.05	142.04	24	40 56.4	14	18	23	06.44	145.25	24	03 10.4
15	16	29	41.09	142.24	24	43 33.2	15	18	25	31.62	145.18	23	58 46.7
16	16	32	03.33	142.44	24	46 01.6	16	18	27	56.72	145.10	23	54 14.2
17	16	34	25.77	142.63	24	48 21.8	17	18	30	21.74	145.02	23	49 33.1
18	16	36	48.40	142.82	24	50 33.6	18	18	32	46.66	144.92	23	44 43.2
19	16	39	11.22	143.00	24	52 37.0	19	18	35	11.49	144.83	23	39 44.8
20	16	41	34.22	143.18	24	54 32.0	20	18	37	36.22	144.73	23	34 37.8
21	16	43	57.40	143.35	24	56 18.5	21	18	40	00.85	144.63	23	29 22.2
22	16	46	20.75	143.51	24	57 56.5	22	18	42	25.36	144.51	23	23 58.1
23	16	48	44.26	143.68	24	59 26.0	23	18	44	49.76	144.40	23	18 25.4
24	16	51	07.94		-25	00 46.9	24	18	47	14.04	144.28	-23	12 44.3

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Friday, November 29							Sunday, December 1						
0	18 ^h 47 ^m 14.04 ^s	144.16	-23 12 44.3	0	20 ^h 39 ^m 17.41 ^s	135.21	-16 09 33.2						
1	18 49 38.20	144.02	23 06 54.8	1	20 41 32.62	135.01	15 58 00.2						
2	18 52 02.22	143.90	23 00 56.8	2	20 43 47.63	134.80	15 46 21.7						
3	18 54 26.12	143.75	22 54 50.5	3	20 46 02.43	134.61	15 34 37.6						
4	18 56 49.87	143.62	22 48 35.9	4	20 48 17.04	134.42	15 22 48.1						
5	18 59 13.49	143.47	22 42 13.0	5	20 50 31.46	134.22	15 10 53.2						
6	19 01 36.96	143.32	22 35 41.9	6	20 52 45.68	134.03	14 58 53.0						
7	19 04 00.28	143.17	22 29 02.6	7	20 54 59.71	133.84	14 46 47.6						
8	19 06 23.45	143.02	22 22 15.1	8	20 57 13.55	133.65	14 34 37.0						
9	19 08 46.47	142.85	22 15 19.5	9	20 59 27.20	133.47	14 22 21.4						
10	19 11 09.32	142.69	22 08 15.9	10	21 01 40.67	133.27	14 10 00.7						
11	19 13 32.01	142.53	22 01 04.3	11	21 03 53.94	133.10	13 57 35.1						
12	19 15 54.54	142.36	21 53 44.7	12	21 06 07.04	132.92	13 45 04.7						
13	19 18 16.90	142.18	21 46 17.2	13	21 08 19.96	132.73	13 32 29.5						
14	19 20 39.08	142.01	21 38 41.8	14	21 10 32.69	132.56	13 19 49.5						
15	19 23 01.09	141.83	21 30 58.7	15	21 12 45.25	132.39	13 07 04.9						
16	19 25 22.92	141.65	21 23 07.7	16	21 14 57.64	132.22	12 54 15.8						
17	19 27 44.57	141.46	21 15 09.1	17	21 17 09.86	132.05	12 41 22.1						
18	19 30 06.03	141.28	21 07 02.8	18	21 19 21.91	131.89	12 28 24.1						
19	19 32 27.31	141.10	20 58 48.9	19	21 21 33.80	131.72	12 15 21.7						
20	19 34 48.41	140.90	20 50 27.5	20	21 23 45.52	131.56	12 02 15.0						
21	19 37 09.31	140.71	20 41 58.6	21	21 25 57.08	131.40	11 49 04.1						
22	19 39 30.02	140.52	20 33 22.2	22	21 28 08.48	131.25	11 35 49.2						
23	19 41 50.54	140.32	-20 24 38.5	23	21 30 19.73	131.10	-11 22 30.2						
Saturday, November 30							Monday, December 2						
0	19 44 10.86	140.13	-20 15 47.5	0	21 32 30.83	130.95	-11 09 07.2						
1	19 46 30.99	139.92	20 06 49.2	1	21 34 41.78	130.81	10 55 40.3						
2	19 48 50.91	139.73	19 57 43.8	2	21 36 52.59	130.66	10 42 09.7						
3	19 51 10.64	139.52	19 48 31.2	3	21 39 03.25	130.53	10 28 35.3						
4	19 53 30.16	139.32	19 39 11.6	4	21 41 13.78	130.39	10 14 57.2						
5	19 55 49.48	139.12	19 29 44.9	5	21 43 24.17	130.26	10 01 15.6						
6	19 58 08.60	138.91	19 20 11.3	6	21 45 34.43	130.13	9 47 30.4						
7	20 00 27.51	138.71	19 10 30.8	7	21 47 44.56	130.00	9 33 41.8						
8	20 02 46.22	138.50	19 00 43.5	8	21 49 54.56	129.89	9 19 49.9						
9	20 05 04.72	138.29	18 50 49.4	9	21 52 04.45	129.77	9 05 54.6						
10	20 07 23.01	138.09	18 40 48.6	10	21 54 14.22	129.65	8 51 56.2						
11	20 09 41.10	137.88	18 30 41.2	11	21 56 23.87	129.54	8 37 54.6						
12	20 11 58.98	137.67	18 20 27.3	12	21 58 33.41	129.44	8 23 50.0						
13	20 14 16.65	137.47	18 10 06.9	13	22 00 42.85	129.33	8 09 42.4						
14	20 16 34.12	137.25	17 59 40.0	14	22 02 52.18	129.24	7 55 31.9						
15	20 18 51.37	137.05	17 49 06.8	15	22 05 01.42	129.14	7 41 18.6						
16	20 21 08.42	136.85	17 38 27.3	16	22 07 10.56	129.05	7 27 02.5						
17	20 23 25.27	136.63	17 27 41.6	17	22 09 19.61	128.96	7 12 43.8						
18	20 25 41.90	136.43	17 16 49.7	18	22 11 28.57	128.88	6 58 22.5						
19	20 27 58.33	136.23	17 05 51.7	19	22 13 37.45	128.80	6 43 58.7						
20	20 30 14.56	136.02	16 54 47.8	20	22 15 46.25	128.72	6 29 32.4						
21	20 32 30.58	135.81	16 43 37.9	21	22 17 54.97	128.66	6 15 03.8						
22	20 34 46.39	135.61	16 32 22.1	22	22 20 03.63	128.59	6 00 32.8						
23	20 37 02.00	135.41	16 21 00.5	23	22 22 12.22	128.52	5 45 59.7						
24	20 39 17.41		-16 09 33.2	24	22 24 20.74		-5 31 24.5						

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension		Declination		Hour	Right Ascension		Declination	
Tuesday, December 3					Thursday, December 5				
0	22 24 20.74	128.47	- 5 31 24.5	+877.3	0	0 07 21.98	130.84	+ 6 24 25.4	+880.9
1	22 26 29.21	128.41	5 16 47.2	879.2	1	0 09 32.82	131.00	6 39 06.3	878.9
2	22 28 37.62	128.36	5 02 08.0	881.2	2	0 11 43.82	131.17	6 53 45.2	876.8
3	22 30 45.98	128.31	4 47 26.8	882.9	3	0 13 54.99	131.32	7 08 22.0	874.7
4	22 32 54.29	128.28	4 32 43.9	884.7	4	0 16 06.31	131.50	7 22 56.7	872.5
5	22 35 02.57	128.23	4 17 59.2	886.3	5	0 18 17.81	131.67	7 37 29.2	870.1
6	22 37 10.80	128.20	4 03 12.9	887.9	6	0 20 29.48	131.84	7 51 59.3	867.7
7	22 39 19.00	128.18	3 48 25.0	889.5	7	0 22 41.32	132.02	8 06 27.0	865.1
8	22 41 27.18	128.15	3 33 35.5	890.8	8	0 24 53.34	132.21	8 20 52.1	862.6
9	22 43 35.33	128.13	3 18 44.7	892.2	9	0 27 05.55	132.40	8 35 14.7	859.9
10	22 45 43.46	128.12	3 03 52.5	893.4	10	0 29 17.95	132.59	8 49 34.6	857.1
11	22 47 51.58	128.10	2 48 59.1	894.6	11	0 31 30.54	132.78	9 03 51.7	854.2
12	22 49 59.68	128.10	2 34 04.5	895.7	12	0 33 43.32	132.98	9 18 05.9	851.3
13	22 52 07.78	128.09	2 19 08.8	896.8	13	0 35 56.30	133.19	9 32 17.2	848.2
14	22 54 15.87	128.10	2 04 12.0	897.6	14	0 38 09.49	133.39	9 46 25.4	845.1
15	22 56 23.97	128.11	1 49 14.4	898.6	15	0 40 22.88	133.60	10 00 30.5	841.9
16	22 58 32.08	128.11	1 34 15.8	899.3	16	0 42 36.48	133.81	10 14 32.4	838.5
17	23 00 40.19	128.13	1 19 16.5	900.1	17	0 44 50.29	134.02	10 28 30.9	835.1
18	23 02 48.32	128.15	1 04 16.4	900.6	18	0 47 04.31	134.25	10 42 26.0	831.6
19	23 04 56.47	128.18	0 49 15.8	901.2	19	0 49 18.56	134.47	10 56 17.6	828.1
20	23 07 04.65	128.21	0 34 14.6	901.7	20	0 51 33.03	134.69	11 10 05.7	824.3
21	23 09 12.86	128.24	0 19 12.9	902.0	21	0 53 47.72	134.92	11 23 50.0	820.5
22	23 11 21.10	128.28	- 0 04 10.9	902.4	22	0 56 02.64	135.15	11 37 30.5	816.7
23	23 13 29.38	128.32	+ 0 10 51.5	+902.5	23	0 58 17.79	135.38	+11 51 07.2	+812.7
Wednesday, December 4					Friday, December 6				
0	23 15 37.70	128.37	+ 0 25 54.0	+902.7	0	1 00 33.17	135.62	+12 04 39.9	+808.7
1	23 17 46.07	128.42	0 40 56.7	902.7	1	1 02 48.79	135.86	12 18 08.6	804.5
2	23 19 54.49	128.48	0 55 59.4	902.8	2	1 05 04.65	136.10	12 31 33.1	800.3
3	23 22 02.97	128.54	1 11 02.2	902.6	3	1 07 20.75	136.35	12 44 53.4	795.9
4	23 24 11.51	128.60	1 26 04.8	902.4	4	1 09 37.10	136.59	12 58 09.3	791.5
5	23 26 20.11	128.68	1 41 07.2	902.2	5	1 11 53.69	136.84	13 11 20.8	787.0
6	23 28 28.79	128.75	1 56 09.4	901.8	6	1 14 10.53	137.09	13 24 27.8	782.3
7	23 30 37.54	128.83	2 11 11.2	901.4	7	1 16 27.62	137.34	13 37 30.1	777.7
8	23 32 46.37	128.91	2 26 12.6	900.8	8	1 18 44.96	137.60	13 50 27.8	772.9
9	23 34 55.28	129.00	2 41 13.4	900.2	9	1 21 02.56	137.85	14 03 20.7	767.9
10	23 37 04.28	129.09	2 56 13.6	899.6	10	1 23 20.41	138.12	14 16 08.6	763.0
11	23 39 13.37	129.19	3 11 13.2	898.7	11	1 25 38.53	138.37	14 28 51.6	757.9
12	23 41 22.56	129.29	3 26 11.9	897.9	12	1 27 56.90	138.63	14 41 29.5	752.8
13	23 43 31.85	129.40	3 41 09.8	896.9	13	1 30 15.53	138.90	14 54 02.3	747.5
14	23 45 41.25	129.50	3 56 06.7	896.0	14	1 32 34.43	139.17	15 06 29.8	742.1
15	23 47 50.75	129.62	4 11 02.7	894.8	15	1 34 53.60	139.43	15 18 51.9	736.7
16	23 50 00.37	129.74	4 25 57.5	893.6	16	1 37 13.03	139.69	15 31 08.6	731.2
17	23 52 10.11	129.87	4 40 51.1	892.3	17	1 39 32.72	139.97	15 43 19.8	725.5
18	23 54 19.98	129.99	4 55 43.4	890.9	18	1 41 52.69	140.23	15 55 25.3	719.8
19	23 56 29.97	130.12	5 10 34.3	889.5	19	1 44 12.92	140.50	16 07 25.1	714.0
20	23 58 40.09	130.26	5 25 23.8	888.0	20	1 46 33.42	140.78	16 19 19.1	708.1
21	0 00 50.35	130.39	5 40 11.8	886.3	21	1 48 54.20	141.04	16 31 07.2	702.1
22	0 03 00.74	130.55	5 54 58.1	884.5	22	1 51 15.24	141.32	16 42 49.3	696.0
23	0 05 11.29	130.69	6 09 42.6	+882.8	23	1 53 36.56	141.59	16 54 25.3	+689.9
24	0 07 21.98	130.98	+ 6 24 25.4		24	1 55 58.15		+17 05 55.2	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Saturday, December 7			Monday, December 9		
0	^h 1 55 58.15 ^m 141.86	[°] +17 05 55.2	0	^h 3 54 01.98 ^m 152.12	[°] +23 50 14.1
1	1 58 20.01 142.13	17 17 18.8	1	3 56 34.10 152.22	23 55 06.8
2	2 00 42.14 142.41	17 28 36.1	2	3 59 06.32 152.30	23 59 50.0
3	2 03 04.55 142.67	17 39 46.9	3	4 01 38.62 152.38	24 04 23.5
4	2 05 27.22 142.95	17 50 51.2	4	4 04 11.00 152.46	24 08 47.5
5	2 07 50.17 143.22	18 01 48.9	5	4 06 43.46 152.52	24 13 01.8
6	2 10 13.39 143.48	18 12 39.9	6	4 09 15.98 152.58	24 17 06.4
7	2 12 36.87 143.76	18 23 24.1	7	4 11 48.56 152.63	24 21 01.4
8	2 15 00.63 144.02	18 34 01.4	8	4 14 21.19 152.68	24 24 46.7
9	2 17 24.65 144.28	18 44 31.8	9	4 16 53.87 152.71	24 28 22.2
10	2 19 48.93 144.55	18 54 55.1	10	4 19 26.58 152.74	24 31 48.0
11	2 22 13.48 144.82	19 05 11.3	11	4 21 59.32 152.77	24 35 04.1
12	2 24 38.30 145.08	19 15 20.3	12	4 24 32.09 152.78	24 38 10.3
13	2 27 03.38 145.34	19 25 22.0	13	4 27 04.87 152.78	24 41 06.8
14	2 29 28.72 145.59	19 35 16.3	14	4 29 37.65 152.78	24 43 53.4
15	2 31 54.31 145.86	19 45 03.2	15	4 32 10.43 152.77	24 46 30.2
16	2 34 20.17 146.10	19 54 42.5	16	4 34 43.20 152.76	24 48 57.2
17	2 36 46.27 146.36	20 04 14.2	17	4 37 15.96 152.72	24 51 14.4
18	2 39 12.63 146.61	20 13 38.2	18	4 39 48.68 152.69	24 53 21.8
19	2 41 39.24 146.85	20 22 54.4	19	4 42 21.37 152.65	24 55 19.4
20	2 44 06.09 147.09	20 32 02.8	20	4 44 54.02 152.60	24 57 07.2
21	2 46 33.18 147.34	20 41 03.3	21	4 47 26.62 152.54	24 58 45.1
22	2 49 00.52 147.57	20 49 55.7	22	4 49 59.16 152.47	25 00 13.3
23	2 51 28.09 147.81	+20 58 40.1	23	4 52 31.63 152.40	+25 01 31.6
		+516.2			+68.5
Sunday, December 8			Tuesday, December 10		
0	2 53 55.90 148.04	+21 07 16.3	0	4 55 04.03 152.32	+25 02 40.1
1	2 56 23.94 148.26	21 15 44.3	1	4 57 36.35 152.23	25 03 38.9
2	2 58 52.20 148.49	21 24 04.0	2	5 00 08.58 152.13	25 04 27.9
3	3 01 20.69 148.70	21 32 15.4	3	5 02 40.71 152.03	25 05 07.1
4	3 03 49.39 148.93	21 40 18.3	4	5 05 12.74 151.91	25 05 36.6
5	3 06 18.32 149.13	21 48 12.7	5	5 07 44.65 151.79	25 05 56.4
6	3 08 47.45 149.33	21 55 58.6	6	5 10 16.44 151.66	25 06 06.6
7	3 11 16.78 149.54	22 03 35.8	7	5 12 48.10 151.52	25 06 07.0
8	3 13 46.32 149.73	22 11 04.4	8	5 15 19.62 151.37	25 05 57.9
9	3 16 16.05 149.93	22 18 24.2	9	5 17 50.99 151.23	25 05 39.1
10	3 18 45.98 150.11	22 25 35.2	10	5 20 22.22 151.07	25 05 10.8
11	3 21 16.09 150.29	22 32 37.3	11	5 22 53.29 150.90	25 04 32.9
12	3 23 46.38 150.47	22 39 30.5	12	5 25 24.19 150.73	25 03 45.4
13	3 26 16.85 150.64	22 46 14.8	13	5 27 54.92 150.54	25 02 48.5
14	3 28 47.49 150.81	22 52 49.9	14	5 30 25.46 150.36	25 01 42.1
15	3 31 18.30 150.97	22 59 16.0	15	5 32 55.82 150.15	25 00 26.3
16	3 33 49.27 151.11	23 05 33.0	16	5 35 25.97 149.96	24 59 01.1
17	3 36 20.38 151.27	23 11 40.7	17	5 37 55.93 149.74	24 57 26.7
18	3 38 51.65 151.41	23 17 39.2	18	5 40 25.67 149.53	24 55 42.9
19	3 41 23.06 151.54	23 23 28.5	19	5 42 55.20 149.30	24 53 49.9
20	3 43 54.60 151.66	23 29 08.4	20	5 45 24.50 149.07	24 51 47.6
21	3 46 26.26 151.79	23 34 39.0	21	5 47 53.57 148.84	24 49 36.3
22	3 48 58.05 151.91	23 40 00.2	22	5 50 22.41 148.60	24 47 15.8
23	3 51 29.96 152.02	23 45 11.9	23	5 52 51.01 148.34	24 44 46.3
24	3 54 01.98 152.12	+23 50 14.1	24	5 55 19.35 148.00	+24 42 07.7
		+302.2			-158.6

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Wednesday, December 11							Friday, December 13						
0	h	m	s	+	°	'	0	h	m	s	+	°	'
1	5 55	19.35	148.09	+24 42	07.7	-167.5	1	7 47	37.83	131.34	+20 00	01.0	-517.0
2	5 57	47.44	147.83	24 39	20.2	176.3	2	7 49	49.17	130.96	19 51	24.0	522.4
3	6 00	15.27	147.56	24 36	23.9	185.3	3	7 52	00.13	130.58	19 42	41.6	527.8
4	6 02	42.83	147.28	24 33	18.6	194.0	4	7 54	10.71	130.19	19 33	53.8	533.1
5	6 05	10.11	147.01	24 30	04.6	202.7	5	7 56	20.90	129.82	19 25	00.7	538.2
6	6 07	37.12	146.72	24 26	41.9	211.3	6	7 58	30.72	129.44	19 16	02.5	543.4
7	6 10	03.84	146.43	24 23	10.6	220.0	7	8 00	40.16	129.05	19 06	59.1	548.5
8	6 12	30.27	146.14	24 19	30.6	228.5	8	8 02	49.21	128.68	18 57	50.6	553.4
9	6 14	56.41	145.83	24 15	42.1	237.0	9	8 04	57.89	128.31	18 48	37.2	558.4
10	6 17	22.24	145.53	24 11	45.1	245.4	10	8 07	06.20	127.93	18 39	18.8	563.2
11	6 19	47.77	145.23	24 07	39.7	253.8	11	8 09	14.13	127.56	18 29	55.6	567.9
12	6 22	13.00	144.90	24 03	25.9	262.0	12	8 11	21.69	127.19	18 20	27.7	572.6
13	6 24	37.90	144.59	23 59	03.9	270.2	13	8 13	28.88	126.82	18 10	55.1	577.2
14	6 27	02.49	144.26	23 54	33.7	278.5	14	8 15	35.70	126.46	18 01	17.9	581.8
15	6 29	26.75	143.93	23 49	55.2	286.5	15	8 17	42.16	126.09	17 51	36.1	586.2
16	6 31	50.68	143.60	23 45	08.7	294.5	16	8 19	48.25	125.72	17 41	49.9	590.6
17	6 34	14.28	143.26	23 40	14.2	302.4	17	8 21	53.97	125.37	17 31	59.3	594.9
18	6 36	37.54	142.93	23 35	11.8	310.4	18	8 23	59.34	125.01	17 22	04.4	599.2
19	6 39	00.47	142.58	23 30	01.4	318.1	19	8 26	04.35	124.65	17 12	05.2	603.3
20	6 41	23.05	142.24	23 24	43.3	325.9	20	8 28	09.00	124.30	17 02	01.9	607.5
21	6 43	45.29	141.88	23 19	17.4	333.5	21	8 30	13.30	123.94	16 51	54.4	611.5
22	6 46	07.17	141.54	23 13	43.9	341.1	22	8 32	17.24	123.60	16 41	42.9	615.4
23	6 48	28.71	141.17	23 08	02.8	348.6	23	8 34	20.84	123.25	16 31	27.5	619.4
	6 50	49.88	140.82	+23 02	14.2	-356.0		8 36	24.09	122.91	+16 21	08.1	-623.2
Thursday, December 12							Saturday, December 14						
0	6 53	10.70	140.46	+22 56	18.2	-363.4	0	8 38	27.00	122.57	+16 10	44.9	-627.0
1	6 55	31.16	140.09	22 50	14.8	370.7	1	8 40	29.57	122.23	16 00	17.9	630.7
2	6 57	51.25	139.72	22 44	04.1	377.9	2	8 42	31.80	121.89	15 49	47.2	634.3
3	7 00	10.97	139.36	22 37	46.2	385.0	3	8 44	33.69	121.56	15 39	12.9	637.8
4	7 02	30.33	138.98	22 31	21.2	392.1	4	8 46	35.25	121.23	15 28	35.1	641.4
5	7 04	49.31	138.61	22 24	49.1	399.1	5	8 48	36.48	120.90	15 17	53.7	644.8
6	7 07	07.92	138.24	22 18	10.0	406.0	6	8 50	37.38	120.58	15 07	08.9	648.2
7	7 09	26.16	137.86	22 11	24.0	412.8	7	8 52	37.96	120.27	14 56	20.7	651.6
8	7 11	44.02	137.49	22 04	31.2	419.5	8	8 54	38.23	120.27	14 45	29.1	654.7
9	7 14	01.51	137.10	21 57	31.7	426.3	9	8 56	38.17	119.94	14 34	34.4	658.0
10	7 16	18.61	136.73	21 50	25.4	432.8	10	8 58	37.80	119.63	14 23	36.4	661.1
11	7 18	35.34	136.34	21 43	12.6	439.4	11	9 00	37.12	119.32	14 12	35.3	664.1
12	7 20	51.68	135.96	21 35	53.2	445.8	12	9 02	36.13	118.71	14 01	31.2	667.1
13	7 23	07.64	135.58	21 28	27.4	452.1	13	9 04	34.84	118.41	13 50	24.1	670.1
14	7 25	23.22	135.19	21 20	55.3	458.5	14	9 06	33.25	118.11	13 39	14.0	673.0
15	7 27	38.41	134.81	21 13	16.8	464.6	15	9 08	31.36	117.81	13 28	01.0	675.8
16	7 29	53.22	134.43	21 05	32.2	470.8	16	9 10	29.17	117.53	13 16	45.2	678.6
17	7 32	07.65	134.04	20 57	41.4	476.8	17	9 12	26.70	117.24	13 05	26.6	681.2
18	7 34	21.69	133.65	20 49	44.6	482.8	18	9 14	23.94	116.96	12 54	05.4	683.9
19	7 36	35.34	133.27	20 41	41.8	488.7	19	9 16	20.90	116.68	12 42	41.5	686.5
20	7 38	48.61	132.89	20 33	33.1	494.5	20	9 18	17.58	116.40	12 31	15.0	689.1
21	7 41	01.50	132.49	20 25	18.6	500.2	21	9 20	13.98	116.13	12 19	45.9	691.5
22	7 43	13.99	132.11	20 16	58.4	505.9	22	9 22	10.11	115.86	12 08	14.4	693.9
23	7 45	26.10	131.73	20 08	32.5	511.5	23	9 24	05.97	115.60	11 56	40.5	696.3
24	7 47	37.83		+20 00	01.0		24	9 26	01.57		+11 45	04.2	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Sunday, December 15			Tuesday, December 17		
0	^{h m s} 9 26 01.57 ^s 115.34	^{° ' "} +11 45 04.2 -698.6	0	^{h m s} 10 54 37.33 ^s 107.59	^{° ' "} + 1 57 42.7 -754.1
1	9 27 56.91 ^s 115.08	11 33 25.6 700.8	1	10 56 24.92 ^s 107.52	1 45 08.6 754.2
2	9 29 51.99 ^s 114.82	11 21 44.8 703.1	2	10 58 12.44 ^s 107.47	1 32 34.4 754.4
3	9 31 46.81 ^s 114.58	11 10 01.7 705.2	3	10 59 59.91 ^s 107.42	1 20 00.0 754.4
4	9 33 41.39 ^s 114.33	10 58 16.5 707.3	4	11 01 47.33 ^s 107.38	1 07 25.6 754.5
5	9 35 35.72 ^s 114.09	10 46 29.2 709.4	5	11 03 34.71 ^s 107.33	0 54 51.1 754.4
6	9 37 29.81 ^s 113.85	10 34 39.8 711.3	6	11 05 22.04 ^s 107.30	0 42 16.7 754.5
7	9 39 23.66 ^s 113.61	10 22 48.5 713.3	7	11 07 09.34 ^s 107.26	0 29 42.2 754.3
8	9 41 17.27 ^s 113.39	10 10 55.2 715.2	8	11 08 56.60 ^s 107.23	0 17 07.9 754.2
9	9 43 10.66 ^s 113.17	9 59 00.0 717.0	9	11 10 43.83 ^s 107.21	+ 0 04 33.7 754.1
10	9 45 03.83 ^s 112.94	9 47 03.0 718.8	10	11 12 31.04 ^s 107.19	- 0 08 00.4 753.9
11	9 46 56.77 ^s 112.72	9 35 04.2 720.6	11	11 14 18.23 ^s 107.17	0 20 34.3 753.7
12	9 48 49.49 ^s 112.51	9 23 03.6 722.3	12	11 16 05.40 ^s 107.16	0 33 08.0 753.4
13	9 50 42.00 ^s 112.30	9 11 01.3 723.9	13	11 17 52.56 ^s 107.15	0 45 41.4 753.1
14	9 52 34.30 ^s 112.09	8 58 57.4 725.5	14	11 19 39.71 ^s 107.15	0 58 14.5 752.8
15	9 54 26.39 ^s 111.90	8 46 51.9 727.1	15	11 21 26.86 ^s 107.15	1 10 47.3 752.4
16	9 56 18.29 ^s 111.69	8 34 44.8 728.5	16	11 23 14.01 ^s 107.16	1 23 19.7 752.1
17	9 58 09.98 ^s 111.50	8 22 36.3 730.1	17	11 25 01.17 ^s 107.16	1 35 51.8 751.5
18	10 00 01.48 ^s 111.31	8 10 26.2 731.4	18	11 26 48.33 ^s 107.17	1 48 23.3 751.1
19	10 01 52.79 ^s 111.13	7 58 14.8 732.8	19	11 28 35.50 ^s 107.20	2 00 54.4 750.6
20	10 03 43.92 ^s 110.95	7 46 02.0 734.1	20	11 30 22.70 ^s 107.21	2 13 25.0 750.1
21	10 05 34.87 ^s 110.77	7 33 47.9 735.5	21	11 32 09.91 ^s 107.25	2 25 55.1 749.5
22	10 07 25.64 ^s 110.59	7 21 32.4 736.6	22	11 33 57.16 ^s 107.27	2 38 24.6 748.9
23	10 09 16.23 ^s 110.43	+ 7 09 15.8 -737.8	23	11 35 44.43 ^s 107.31	- 2 50 53.5 -748.2
Monday, December 16			Wednesday, December 18		
0	10 11 06.66 ^s 110.27	+ 6 56 58.0 -739.0	0	11 37 31.74 ^s 107.35	- 3 03 21.7 -747.5
1	10 12 56.93 ^s 110.10	6 44 39.0 740.1	1	11 39 19.09 ^s 107.38	3 15 49.2 746.8
2	10 14 47.03 ^s 109.95	6 32 18.9 741.1	2	11 41 06.47 ^s 107.44	3 28 16.0 746.0
3	10 16 36.98 ^s 109.80	6 19 57.8 742.1	3	11 42 53.91 ^s 107.49	3 40 42.0 745.3
4	10 18 26.78 ^s 109.65	6 07 35.7 743.2	4	11 44 41.40 ^s 107.54	3 53 07.3 744.4
5	10 20 16.43 ^s 109.50	5 55 12.5 744.0	5	11 46 28.94 ^s 107.60	4 05 31.7 743.5
6	10 22 05.93 ^s 109.37	5 42 48.5 744.9	6	11 48 16.54 ^s 107.67	4 17 55.2 742.6
7	10 23 55.30 ^s 109.23	5 30 23.6 745.8	7	11 50 04.21 ^s 107.73	4 30 17.8 741.7
8	10 25 44.53 ^s 109.10	5 17 57.8 746.6	8	11 51 51.94 ^s 107.81	4 42 39.5 740.7
9	10 27 33.63 ^s 108.97	5 05 31.2 747.3	9	11 53 39.75 ^s 107.88	4 55 00.2 739.7
10	10 29 22.60 ^s 108.86	4 53 03.9 748.1	10	11 55 27.63 ^s 107.96	5 07 19.9 738.6
11	10 31 11.46 ^s 108.73	4 40 35.8 748.8	11	11 57 15.59 ^s 108.04	5 19 38.5 737.5
12	10 33 00.19 ^s 108.62	4 28 07.0 749.4	12	11 59 03.63 ^s 108.13	5 31 56.0 736.4
13	10 34 48.81 ^s 108.51	4 15 37.6 750.1	13	12 00 51.76 ^s 108.23	5 44 12.4 735.2
14	10 36 37.32 ^s 108.41	4 03 07.5 750.6	14	12 02 39.99 ^s 108.32	5 56 27.6 734.0
15	10 38 25.73 ^s 108.30	3 50 36.9 751.1	15	12 04 28.31 ^s 108.43	6 08 41.6 732.8
16	10 40 14.03 ^s 108.21	3 38 05.8 751.6	16	12 06 16.74 ^s 108.52	6 20 54.4 731.5
17	10 42 02.24 ^s 108.11	3 25 34.2 752.0	17	12 08 05.26 ^s 108.64	6 33 05.9 730.1
18	10 43 50.35 ^s 108.03	3 13 02.2 752.4	18	12 09 53.90 ^s 108.75	6 45 16.0 728.8
19	10 45 38.38 ^s 107.94	3 00 29.8 752.9	19	12 11 42.65 ^s 108.87	6 57 24.8 727.5
20	10 47 26.32 ^s 107.86	2 47 56.9 753.1	20	12 13 31.52 ^s 108.99	7 09 32.3 725.9
21	10 49 14.18 ^s 107.79	2 35 23.8 753.5	21	12 15 20.51 ^s 109.12	7 21 38.2 724.5
22	10 51 01.97 ^s 107.71	2 22 50.3 753.7	22	12 17 09.63 ^s 109.24	7 33 42.7 723.0
23	10 52 49.68 ^s 107.65	2 10 16.6 753.9	23	12 18 58.87 ^s 109.38	7 45 45.7 -721.5
24	10 54 37.33 ^s	+ 1 57 42.7	24	12 20 48.25 ^s	- 7 57 47.2

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Thursday, December 19							Saturday, December 21						
0	12	20	48.25	109.52	7 57	47.2	0	13	52	10.30	120.48	16 50	15.3
1	12	22	37.77	109.65	8 09	47.1	1	13	54	10.78	120.78	17 00	05.4
2	12	24	27.42	109.80	8 21	45.3	2	13	56	11.56	121.10	17 09	51.4
3	12	26	17.22	109.95	8 33	41.8	3	13	58	12.66	121.40	17 19	33.5
4	12	28	07.17	110.11	8 45	36.6	4	14	00	14.06	121.72	17 29	11.5
5	12	29	57.28	110.26	8 57	29.7	5	14	02	15.78	122.04	17 38	45.3
6	12	31	47.54	110.42	9 09	21.0	6	14	04	17.82	122.35	17 48	14.9
7	12	33	37.96	110.59	9 21	10.4	7	14	06	20.17	122.68	17 57	40.3
8	12	35	28.55	110.76	9 32	57.9	8	14	08	22.85	123.00	18 07	01.3
9	12	37	19.31	110.93	9 44	43.6	9	14	10	25.85	123.32	18 16	17.9
10	12	39	10.24	111.11	9 56	27.2	10	14	12	29.17	123.66	18 25	30.1
11	12	41	01.35	111.29	10 08	08.9	11	14	14	32.83	123.98	18 34	37.7
12	12	42	52.64	111.48	10 19	48.5	12	14	16	36.81	124.31	18 43	40.8
13	12	44	44.12	111.66	10 31	26.0	13	14	18	41.12	124.64	18 52	39.3
14	12	46	35.78	111.85	10 43	01.4	14	14	20	45.76	124.98	19 01	33.0
15	12	48	27.63	112.06	10 54	34.6	15	14	22	50.74	125.32	19 10	22.0
16	12	50	19.69	112.25	11 06	05.5	16	14	24	56.06	125.65	19 19	06.2
17	12	52	11.94	112.45	11 17	34.2	17	14	27	01.71	126.00	19 27	45.4
18	12	54	04.39	112.67	11 29	00.6	18	14	29	07.71	126.33	19 36	19.8
19	12	55	57.06	112.87	11 40	24.6	19	14	31	14.04	126.67	19 44	49.1
20	12	57	49.93	113.09	11 51	46.2	20	14	33	20.71	127.02	19 53	13.3
21	12	59	43.02	113.31	12 03	05.4	21	14	35	27.73	127.36	20 01	32.3
22	13	01	36.33	113.53	12 14	22.0	22	14	37	35.09	127.70	20 09	46.2
23	13	03	29.86	113.75	12 25	36.1	23	14	39	42.79	128.05	20 17	54.8
Friday, December 20							Sunday, December 22						
0	13	05	23.61	113.99	12 36	47.6	0	14	41	50.84	128.39	20 25	58.0
1	13	07	17.60	114.21	12 47	56.5	1	14	43	59.23	128.74	20 33	55.8
2	13	09	11.81	114.46	12 59	02.7	2	14	46	07.97	129.09	20 41	48.2
3	13	11	06.27	114.69	13 10	06.1	3	14	48	17.06	129.44	20 49	35.0
4	13	13	00.96	114.94	13 21	06.7	4	14	50	26.50	129.78	20 57	16.2
5	13	14	55.90	115.18	13 32	04.6	5	14	52	36.28	130.14	21 04	51.7
6	13	16	51.08	115.43	13 42	59.5	6	14	54	46.42	130.48	21 12	21.5
7	13	18	46.51	115.69	13 53	51.5	7	14	56	56.90	130.83	21 19	45.5
8	13	20	42.20	115.94	14 04	40.4	8	14	59	07.73	131.17	21 27	03.6
9	13	22	38.14	116.21	14 15	26.4	9	15	01	18.90	131.53	21 34	15.7
10	13	24	34.35	116.47	14 26	09.3	10	15	03	30.43	131.87	21 41	21.9
11	13	26	30.82	116.73	14 36	49.0	11	15	05	42.30	132.22	21 48	22.0
12	13	28	27.55	117.00	14 47	25.6	12	15	07	54.52	132.57	21 55	15.9
13	13	30	24.55	117.28	14 57	58.9	13	15	10	07.09	132.91	22 02	03.7
14	13	32	21.83	117.56	15 08	28.9	14	15	12	20.00	133.26	22 08	45.1
15	13	34	19.39	117.83	15 18	55.5	15	15	14	33.26	133.60	22 15	20.2
16	13	36	17.22	118.12	15 29	18.7	16	15	16	46.86	133.95	22 21	48.9
17	13	38	15.34	118.40	15 39	38.5	17	15	19	00.81	134.29	22 28	11.1
18	13	40	13.74	118.69	15 49	54.8	18	15	21	15.10	134.63	22 34	26.8
19	13	42	12.43	118.98	16 00	07.4	19	15	23	29.73	134.97	22 40	35.8
20	13	44	11.41	119.27	16 10	16.5	20	15	25	44.70	135.31	22 46	38.2
21	13	46	10.68	119.58	16 20	21.9	21	15	28	00.01	135.64	22 52	33.8
22	13	48	10.26	119.87	16 30	23.5	22	15	30	15.65	135.98	22 58	22.6
23	13	50	10.13	120.17	16 40	21.3	23	15	32	31.63	136.31	23 04	04.6
24	13	52	10.30		16 50	15.3	24	15	34	47.94		23 09	39.6

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Monday, December 23			Wednesday, December 25		
0	15 34 47.94 ^{h m s}	-23 09 39.6 [°]	0	17 29 14.18 ^{h m s}	-25 02 41.2 [°]
1	15 37 04.58 ^s	23 15 07.6	1	17 31 41.95 ^s	25 01 29.7 ⁺
2	15 39 21.56 ^s	23 20 28.6	2	17 34 09.81 ^s	25 00 08.9
3	15 41 38.86 ^s	23 25 42.4	3	17 36 37.75 ^s	24 58 38.9
4	15 43 56.48 ^s	23 30 49.0	4	17 39 05.77 ^s	24 56 59.7
5	15 46 14.43 ^s	23 35 48.3	5	17 41 33.87 ^s	24 55 11.2
6	15 48 32.69 ^s	23 40 40.3	6	17 44 02.02 ^s	24 53 13.5
7	15 50 51.27 ^s	23 45 25.0	7	17 46 30.24 ^s	24 51 06.5
8	15 53 10.16 ^s	23 50 02.1	8	17 48 58.50 ^s	24 48 50.2
9	15 55 29.36 ^s	23 54 31.8	9	17 51 26.80 ^s	24 46 24.7
10	15 57 48.87 ^s	23 58 53.9	10	17 53 55.15 ^s	24 43 49.9
11	16 00 08.69 ^s	24 03 08.4	11	17 56 23.52 ^s	24 41 05.8
12	16 02 28.80 ^s	24 07 15.2	12	17 58 51.91 ^s	24 38 12.5
13	16 04 49.21 ^s	24 11 14.2	13	18 01 20.32 ^s	24 35 09.9
14	16 07 09.91 ^s	24 15 05.4	14	18 03 48.74 ^s	24 31 58.0
15	16 09 30.91 ^s	24 18 48.8	15	18 06 17.16 ^s	24 28 36.9
16	16 11 52.18 ^s	24 22 24.2	16	18 08 45.58 ^s	24 25 06.5
17	16 14 13.74 ^s	24 25 51.6	17	18 11 13.99 ^s	24 21 26.9
18	16 16 35.58 ^s	24 29 11.0	18	18 13 42.37 ^s	24 17 38.0
19	16 18 57.69 ^s	24 32 22.4	19	18 16 10.74 ^s	24 13 40.0
20	16 21 20.06 ^s	24 35 25.5	20	18 18 39.07 ^s	24 09 32.8
21	16 23 42.70 ^s	24 38 20.5	21	18 21 07.36 ^s	24 05 16.4
22	16 26 05.60 ^s	24 41 07.2	22	18 23 35.61 ^s	24 00 50.8
23	16 28 28.76 ^s	-24 43 45.6	23	18 26 03.82 ^s	-23 56 16.0
	143.40	-150.0		148.14	+283.8
Tuesday, December 24			Thursday, December 26		
0	16 30 52.16 ^s	-24 46 15.6	0	18 28 31.96 ^s	-23 51 32.2
1	16 33 15.81 ^s	24 48 37.3	1	18 31 00.04 ^s	23 46 39.3
2	16 35 39.70 ^s	24 50 50.4	2	18 33 28.05 ^s	23 41 37.3
3	16 38 03.82 ^s	24 52 55.1	3	18 35 55.99 ^s	23 36 26.2
4	16 40 28.17 ^s	24 54 51.3	4	18 38 23.85 ^s	23 31 06.1
5	16 42 52.74 ^s	24 56 38.8	5	18 40 51.61 ^s	23 25 37.1
6	16 45 17.53 ^s	24 58 17.7	6	18 43 19.29 ^s	23 19 59.1
7	16 47 42.53 ^s	24 59 48.0	7	18 45 46.87 ^s	23 14 12.2
8	16 50 07.74 ^s	25 01 09.6	8	18 48 14.35 ^s	23 08 16.5
9	16 52 33.15 ^s	25 02 22.4	9	18 50 41.71 ^s	23 02 11.9
10	16 54 58.76 ^s	25 03 26.4	10	18 53 08.97 ^s	22 55 58.5
11	16 57 24.55 ^s	25 04 21.6	11	18 55 36.10 ^s	22 49 36.3
12	16 59 50.53 ^s	25 05 07.9	12	18 58 03.11 ^s	22 43 05.4
13	17 02 16.68 ^s	25 05 45.3	13	19 00 29.99 ^s	22 36 25.8
14	17 04 43.01 ^s	25 06 13.8	14	19 02 56.73 ^s	22 29 37.6
15	17 07 09.50 ^s	25 06 33.3	15	19 05 23.33 ^s	22 22 40.8
16	17 09 36.14 ^s	25 06 43.8	16	19 07 49.79 ^s	22 15 35.5
17	17 12 02.94 ^s	25 06 45.3	17	19 10 16.10 ^s	22 08 21.7
18	17 14 29.87 ^s	25 06 37.8	18	19 12 42.25 ^s	22 00 59.4
19	17 16 56.95 ^s	25 06 21.2	19	19 15 08.25 ^s	21 53 28.7
20	17 19 24.16 ^s	25 05 55.5	20	19 17 34.09 ^s	21 45 49.7
21	17 21 51.49 ^s	25 05 20.6	21	19 19 59.75 ^s	21 38 02.4
22	17 24 18.95 ^s	25 04 36.7	22	19 22 25.25 ^s	21 30 06.9
23	17 26 46.51 ^s	25 03 43.5	23	19 24 50.58 ^s	21 22 03.2
24	17 29 14.18 ^s	-25 02 41.2	24	19 27 15.72 ^s	-21 13 51.4
	(330/3544)				+491.8

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension			Declination			Hour	Right Ascension			Declination		
Friday, December 27							Sunday, December 29						
0	19	27	15.72	144.96	-21	13 51.4	0	21	19	13.47	-12	24 12.5	+800.1
1	19	29	40.68	144.78	21	05 31.5	1	21	21	28.07	12	10 52.4	804.3
2	19	32	05.46	144.59	20	57 03.7	2	21	23	42.47	11	57 28.1	808.5
3	19	34	30.05	144.40	20	48 27.9	3	21	25	56.67	11	43 59.6	812.4
4	19	36	54.45	144.20	20	39 44.2	4	21	28	10.67	11	30 27.2	816.5
5	19	39	18.65	144.00	20	30 52.7	5	21	30	24.48	11	16 50.7	820.3
6	19	41	42.65	143.80	20	21 53.4	6	21	32	38.11	11	03 10.4	824.1
7	19	44	06.45	143.61	20	12 46.5	7	21	34	51.54	10	49 26.3	827.8
8	19	46	30.06	143.39	20	03 32.0	8	21	37	04.79	10	35 38.5	831.5
9	19	48	53.45	143.19	19	54 09.9	9	21	39	17.85	10	21 47.0	834.9
10	19	51	16.64	142.98	19	44 40.4	10	21	41	30.74	10	07 52.1	838.4
11	19	53	39.62	142.76	19	35 03.4	11	21	43	43.45	9	53 53.7	841.7
12	19	56	02.38	142.55	19	25 19.1	12	21	45	55.98	9	39 52.0	845.0
13	19	58	24.93	142.34	19	15 27.5	13	21	48	08.35	9	25 47.0	848.1
14	20	00	47.27	142.11	19	05 28.8	14	21	50	20.54	9	11 38.9	851.3
15	20	03	09.38	141.90	18	55 22.9	15	21	52	32.57	8	57 27.6	854.2
16	20	05	31.28	141.68	18	45 10.0	16	21	54	44.45	8	43 13.4	857.1
17	20	07	52.96	141.45	18	34 50.1	17	21	56	56.16	8	28 56.3	860.0
18	20	10	14.41	141.23	18	24 23.3	18	21	59	07.72	8	14 36.3	862.7
19	20	12	35.64	141.01	18	13 49.7	19	22	01	19.13	8	00 13.6	865.3
20	20	14	56.65	140.79	18	03 09.4	20	22	03	30.39	7	45 48.3	867.9
21	20	17	17.44	140.55	17	52 22.4	21	22	05	41.50	7	31 20.4	870.3
22	20	19	37.99	140.33	17	41 28.8	22	22	07	52.48	7	16 50.1	872.8
23	20	21	58.32	140.10	-17	30 28.7	23	22	10	03.32	-7	02 17.3	+875.0
Saturday, December 28							Monday, December 30						
0	20	24	18.42	139.88	-17	19 22.2	0	22	12	14.03	-6	47 42.3	+877.2
1	20	26	38.30	139.64	17	08 09.3	1	22	14	24.61	6	33 05.1	879.4
2	20	28	57.94	139.42	16	56 50.2	2	22	16	35.07	6	18 25.7	881.4
3	20	31	17.36	139.19	16	45 24.9	3	22	18	45.40	6	03 44.3	883.4
4	20	33	36.55	138.96	16	33 53.5	4	22	20	55.62	5	49 00.9	885.2
5	20	35	55.51	138.74	16	22 16.1	5	22	23	05.72	5	34 15.7	887.1
6	20	38	14.25	138.51	16	10 32.7	6	22	25	15.71	5	19 28.6	888.7
7	20	40	32.76	138.28	15	58 43.4	7	22	27	25.60	5	04 39.9	890.3
8	20	42	51.04	138.05	15	46 48.4	8	22	29	35.38	4	49 49.6	891.8
9	20	45	09.09	137.83	15	34 47.8	9	22	31	45.07	4	34 57.8	893.3
10	20	47	26.92	137.60	15	22 41.5	10	22	33	54.66	4	20 04.5	894.6
11	20	49	44.52	137.38	15	10 29.6	11	22	36	04.16	4	05 09.9	895.9
12	20	52	01.90	137.16	14	58 12.4	12	22	38	13.58	3	50 14.0	897.1
13	20	54	19.06	136.93	14	45 49.8	13	22	40	22.92	3	35 16.9	898.1
14	20	56	35.99	136.72	14	33 21.9	14	22	42	32.18	3	20 18.8	899.2
15	20	58	52.71	136.49	14	20 48.8	15	22	44	41.36	3	05 19.6	900.0
16	21	01	09.20	136.28	14	08 10.7	16	22	46	50.48	2	50 19.6	900.9
17	21	03	25.48	136.06	13	55 27.5	17	22	48	59.53	2	35 18.7	901.7
18	21	05	41.54	135.85	13	42 39.4	18	22	51	08.52	2	20 17.0	902.4
19	21	07	57.39	135.63	13	29 46.5	19	22	53	17.46	2	05 14.6	902.9
20	21	10	13.02	135.41	13	16 48.9	20	22	55	26.34	1	50 11.7	903.5
21	21	12	28.45	135.23	13	03 46.5	21	22	57	35.18	1	35 08.2	903.8
22	21	14	43.66	135.01	12	50 39.6	22	22	59	43.97	1	20 04.4	904.2
23	21	16	58.67	134.80	12	37 28.3	23	23	01	52.73	1	05 00.2	+904.5
24	21	19	13.47		-12	24 12.5	24	23	04	01.45	-	04 55.7	

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour	Right Ascension	Declination	Hour	Right Ascension	Declination
Tuesday, December 31					
0	^h 23 ^m 04 ^s 01.45 [°] 128.69	[°] 0 49 55.7 ⁺ 904.6	12	^h 23 ^m 29 ^s 45.05 [°] 128.68	[°] 2 10 47.2 ⁺ 900.2
1	^h 23 ^m 06 ^s 10.14 [°] 128.67	[°] 0 34 51.1 ⁺ 904.7	13	^h 23 ^m 31 ^s 53.73 [°] 128.70	[°] 2 25 47.4 ⁺ 899.3
2	^h 23 ^m 08 ^s 18.81 [°] 128.65	[°] 0 19 46.4 ⁺ 904.7	14	^h 23 ^m 34 ^s 02.43 [°] 128.74	[°] 2 40 46.7 ⁺ 898.3
3	^h 23 ^m 10 ^s 27.46 [°] 128.63	[°] 0 04 41.7 ⁺ 904.7	15	^h 23 ^m 36 ^s 11.17 [°] 128.77	[°] 2 55 45.0 ⁺ 897.2
4	^h 23 ^m 12 ^s 36.09 [°] 128.61	[°] 0 10 23.0 ⁺ 904.4	16	^h 23 ^m 38 ^s 19.94 [°] 128.81	[°] 3 10 42.2 ⁺ 896.0
5	^h 23 ^m 14 ^s 44.70 [°] 128.61	[°] 0 25 27.4 ⁺ 904.3	17	^h 23 ^m 40 ^s 28.75 [°] 128.86	[°] 3 25 38.2 ⁺ 894.8
6	^h 23 ^m 16 ^s 53.31 [°] 128.61	[°] 0 40 31.7 ⁺ 903.9	18	^h 23 ^m 42 ^s 37.61 [°] 128.90	[°] 3 40 33.0 ⁺ 893.6
7	^h 23 ^m 19 ^s 01.92 [°] 128.61	[°] 0 55 35.6 ⁺ 903.5	19	^h 23 ^m 44 ^s 46.51 [°] 128.96	[°] 3 55 26.6 ⁺ 892.1
8	^h 23 ^m 21 ^s 10.53 [°] 128.61	[°] 1 10 39.1 ⁺ 902.9	20	^h 23 ^m 46 ^s 55.47 [°] 129.02	[°] 4 10 18.7 ⁺ 890.6
9	^h 23 ^m 23 ^s 19.14 [°] 128.62	[°] 1 25 42.0 ⁺ 902.4	21	^h 23 ^m 49 ^s 04.49 [°] 129.08	[°] 4 25 09.3 ⁺ 889.1
10	^h 23 ^m 25 ^s 27.76 [°] 128.64	[°] 1 40 44.4 ⁺ 901.8	22	^h 23 ^m 51 ^s 13.57 [°] 129.15	[°] 4 39 58.4 ⁺ 887.4
11	^h 23 ^m 27 ^s 36.40 [°] 128.65	[°] 1 55 46.2 ⁺ 901.0	23	^h 23 ^m 53 ^s 22.72 [°] 129.22	[°] 4 54 45.8 ⁺ 885.7
12	^h 23 ^m 29 ^s 45.05 [°] 128.65	[°] 2 10 47.2 ⁺ 900.2	24	^h 23 ^m 55 ^s 31.94 [°] 129.22	[°] 5 09 31.5 ⁺ 884.0

PHASES OF THE MOON

● New Moon ...	Jan. ^d 5 ^h 05 ^m 20.1	Apr. ^d 3 ^h 12 ^m 10.6	June ^d 30 ^h 19 ^m 44.5	Sept. ^d 27 ^h 17 ^m 29.4
☾ First Quarter...	11 20 54.7	10 17 42.1	July 8 22 28.3	Oct. 5 13 39.5
○ Full Moon ...	19 15 44.2	18 21 09.6	16 05 00.4	12 04 39.0
☾ Last Quarter ...	27 19 58.6	26 04 20.5	22 19 42.1	19 05 36.3
● New Moon ...	Feb. 3 16 27.4	May 2 21 36.3	30 09 32.4	27 10 15.4
☾ First Quarter...	10 09 24.6	10 11 54.3	Aug. 7 13 22.9	Nov. 3 23 11.9
○ Full Moon ...	18 11 17.1	18 09 57.1	14 12 43.5	10 14 41.8
☾ Last Quarter ...	26 10 14.4	25 09 44.2	21 03 17.4	18 00 35.8
● New Moon ...	Mar. 5 02 40.4	June 1 07 52.1	29 01 00.3	26 02 35.9
☾ First Quarter...	12 00 30.2	9 05 49.3	Sept. 6 02 26.1	Dec. 3 07 27.8
○ Full Moon ...	20 05 31.4	16 20 20.1	12 20 18.3	10 03 10.3
☾ Last Quarter ...	27 20 50.6	23 14 21.3	19 14 22.8	17 21 57.3
● New Moon ...	Apr. 3 12 10.6	30 19 44.5	27 17 29.4	25 17 49.4
☾ First Quarter...	10 17 42.1	July 8 22 28.3	Oct. 5 13 39.5	32 15 14.6

PERIGEE

APOGEE

January ... ^d 6 ^h 11.7	July ... ^d 18 ^h 02.7	January ... ^d 21 ^h 22.0	August ... ^d 2 ^h 18.1
February ... ^d 3 ^h 23.4	August ... ^d 15 ^h 08.1	February ... ^d 17 ^h 23.2	August ... ^d 30 ^h 02.3
March ... ^d 4 ^h 11.9	September ... ^d 12 ^h 18.1	March ... ^d 17 ^h 04.6	September ... ^d 26 ^h 04.6
April ... ^d 1 ^h 20.2	October ... ^d 11 ^h 04.6	April ... ^d 13 ^h 19.8	October ... ^d 23 ^h 13.4
April ... ^d 29 ^h 16.0	November ... ^d 8 ^h 10.8	May ... ^d 11 ^h 14.3	November ... ^d 20 ^h 06.0
May ... ^d 25 ^h 16.5	December ... ^d 5 ^h 22.1	June ... ^d 8 ^h 09.2	December ... ^d 18 ^h 02.7
June ... ^d 20 ^h 10.1	December ... ^d 30 ^h 15.4	July ... ^d 6 ^h 03.0	

MOON, 1935

AT TRANSIT AT GREENWICH

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
Jan. 0	S II U	^{h m s} 14 02 25.59 1633.31	67.54	-18 02 20.7 7838.8	15 28.95	56 49.36
0	II L	14 29 38.90 1709.76	69.11	20 12 59.5 6992.9	15 36.60	57 17.45
1	S II U	14 58 08.66 1788.78	70.74	22 09 32.4 5953.1	15 44.51	57 46.47
1	II L	15 27 57.44 1865.99	72.35	23 48 45.5 4710.6	15 52.51	58 15.84
2	II U	15 59 03.43 1936.03	73.83	25 07 16.1 3268.5	16 00.42	58 44.88
2	II L	16 31 19.46 1993.08	75.09	-26 01 44.6 1649.4	16 08.04	59 12.84
3	II U	17 04 32.54 2031.76	76.02	26 29 14.0 103.8	16 15.15	59 38.96
3	II L	17 38 24.30 2048.44	76.55	26 27 30.2 1930.0	16 21.55	60 02.44
4	II U	18 12 32.74 2042.07	76.63	25 55 20.2 3754.9	16 27.03	60 22.55
4	II L	18 46 34.81 2014.43	76.28	24 52 45.3 5501.8	16 31.41	60 38.63
5	I U	19 20 09.24 1969.80	75.55	-23 21 03.5 7102.6	16 34.56	60 50.19
6	II L	19 52 59.04 1913.86	74.54	21 22 40.9 8504.9	16 36.39	60 56.92
6	I U	20 24 52.90 1852.44	73.36	19 00 56.0 9676.2	16 36.88	60 58.69
7	II L	20 55 45.34 1790.86	72.11	16 19 39.8 10601.8	16 36.04	60 55.60
7	I U	21 25 36.20 1733.18	70.89	13 22 58.0 11282.8	16 33.95	60 47.93
8	II L	21 54 29.38 1682.38	69.77	-10 14 55.2 11730.3	16 30.72	60 36.11
8	S I U	22 22 31.76 1640.26	68.81	6 59 24.9 11961.7	16 26.52	60 20.68
9	II L	22 49 52.02 1607.80	68.03	3 40 03.2 11996.5	16 21.51	60 02.29
9	S I U	23 16 39.82 1585.32	67.46	-0 20 06.7 11854.5	16 15.87	59 41.58
10	II L	23 43 05.14 1572.68	67.10	+2 57 27.8 11553.6	16 09.77	59 19.19
10	S I U	0 09 17.82 1569.28	66.95	+6 10 01.4 11108.8	16 03.39	58 55.77
11	II L	0 35 27.10 1574.34	66.98	9 15 10.2 10532.8	15 56.87	58 31.86
11	S I U	1 01 41.44 1586.75	67.18	12 10 43.0 9835.4	15 50.35	58 07.93
12	II L	1 28 08.19 1605.08	67.52	14 54 38.4 9024.7	15 43.94	57 44.38
12	S I U	1 54 53.27 1627.52	67.97	17 25 03.1 8107.9	15 37.72	57 21.55
13	II L	2 22 00.79 1652.06	68.47	+19 40 11.0 7092.8	15 31.76	56 59.68
13	S I U	2 49 32.85 1676.32	68.98	21 38 23.8 5988.7	15 26.11	56 38.94
14	II L	3 17 29.17 1697.83	69.45	23 18 12.5 4808.1	15 20.80	56 19.45
14	S I U	3 45 47.00 1714.12	69.83	24 38 20.6 3567.2	15 15.85	56 01.27
15	II L	4 14 21.12 1723.03	70.06	25 37 47.8 2285.6	15 11.26	55 44.43
15	S I U	4 43 04.15 1722.99	70.12	+26 15 53.4 987.1	15 07.03	55 28.92
16	II L	5 11 47.14 1713.22	69.98	26 32 20.5 303.2	15 03.16	55 14.72
16	N I U	5 40 20.36 1693.79	69.64	26 27 17.3 1559.9	14 59.64	55 01.79
17	II L	6 08 34.15 1665.67	69.09	26 01 17.4 2759.6	14 56.45	54 50.09
17	N I U	6 36 19.82 1630.57	68.38	25 15 17.8 3883.3	14 53.59	54 39.58
18	II L	7 03 30.39 1590.51	67.54	+24 10 34.5 4915.3	14 51.05	54 30.24
18	N I U	7 30 00.90 1547.80	66.62	22 48 39.2 5846.6	14 48.82	54 22.07
19	II L	7 55 48.70 1504.57	65.66	21 11 12.6 6672.5	14 46.91	54 15.07
20	S II U	8 20 53.27 1462.76	64.70	19 20 00.1 7392.2	14 45.33	54 09.26
20	II L	8 45 16.03 1423.99	63.79	17 16 47.9 8008.6	14 44.09	54 04.71
21	S II U	9 09 00.02 1389.61	62.96	+15 03 19.3 8525.9	14 43.21	54 01.47
21	II L	9 32 09.63 1360.53	62.24	12 41 13.4 8949.3	14 42.71	53 59.65
22	S II U	9 54 50.16 1337.57	61.65	10 12 04.1 9284.9	14 42.62	53 59.33
22	II L	10 17 07.73 1321.29	61.21	7 37 19.2 9537.8	14 42.98	54 00.65
23	S II U	10 39 09.02	60.94	+4 58 21.4	14 43.82	54 03.73

Jan. 15 U Defective Illumination of N 0°.80

Jan. 16 U Defective Illumination of S 0°.23

Jan. 17 U Defective Illumination of S 0°.98

Jan. 18 U Defective Illumination of S 0°.37

Jan. 20 U Defective Illumination of I 0°.14

Jan. 20 U Defective Illumination of N 0°.32

MOON, 1935

AT TRANSIT AT GREENWICH

165

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
Jan. 23	S II U	^{h m s} 10 39 09.02	60.94	+ 4 58 21.4	14 43.82	54 03.73
23	II L	11 01 01.16	60.85	+ 2 16 29.5	14 45.17	54 08.68
24	S II U	11 22 51.62	60.93	- 0 27 00.9	14 47.07	54 15.65
24	II L	11 44 48.25	61.21	3 10 54.7	14 49.55	54 24.75
25	S II U	12 06 59.16	61.68	5 53 56.5	14 52.64	54 36.10
25	II L	12 29 32.74	62.35	- 8 34 46.6	14 56.36	54 49.76
26	S II U	12 52 37.59	63.20	11 11 59.5	15 00.73	55 05.80
26	II L	13 16 22.40	64.24	13 44 00.9	15 05.76	55 24.25
27	S II U	13 40 55.83	65.45	16 09 05.0	15 11.43	55 45.06
27	II L	14 06 26.01	66.82	18 25 10.9	15 17.72	56 08.16
28	S II U	14 33 00.26	68.29	-20 30 02.1	15 24.60	56 33.41
28	II L	15 00 44.28	69.82	22 21 05.6	15 31.99	57 00.55
29	S II U	15 29 41.24	71.36	23 55 33.1	15 39.81	57 29.25
29	II L	15 59 50.97	72.81	25 10 26.7	15 47.94	57 59.08
30	S II U	16 31 08.87	74.09	26 02 47.9	15 56.23	58 29.50
30	II L	17 03 25.51	75.11	-26 29 50.4	16 04.50	58 59.85
31	N II U	17 36 26.70	75.79	26 29 16.3	16 12.55	59 29.39
31	II L	18 09 54.49	76.09	25 59 34.3	16 20.15	59 57.29
Feb. 1	II U	18 43 29.05	75.99	25 00 11.9	16 27.07	60 22.68
1	II L	19 16 51.04	75.53	23 31 44.3	16 33.07	60 44.73
2	II U	19 49 43.78	74.79	-21 35 53.6	16 37.95	61 02.64
2	II L	20 21 54.88	73.85	19 15 20.0	16 41.52	61 15.76
3	II U	20 53 17.01	72.81	16 33 29.1	16 43.66	61 23.61
4	II L	21 23 47.69	71.75	13 34 16.1	16 44.28	61 25.89
4	I U	21 53 28.57	70.77	10 21 50.7	16 43.38	61 22.59
5	I L	22 22 24.50	69.90	- 7 00 24.7	16 41.01	61 13.88
5	I U	22 50 42.50	69.21	3 34 02.8	16 37.28	61 00.17
6	II L	23 18 30.82	68.69	- 0 06 35.2	16 32.34	60 42.05
6	I U	23 45 58.29	68.37	+ 3 18 25.3	16 26.39	60 20.19
7	II L	0 13 13.70	68.23	6 37 45.4	16 19.63	59 55.39
7	S I U	0 40 25.36	68.27	+ 9 48 31.5	16 12.29	59 28.44
8	II L	1 07 40.68	68.45	12 48 07.9	16 04.57	59 00.12
8	S I U	1 35 05.86	68.74	15 34 16.6	15 56.69	58 31.18
9	II L	2 02 45.49	69.11	18 04 55.9	15 48.81	58 02.25
9	S I U	2 30 42.34	69.51	20 18 18.9	15 41.08	57 33.90
10	II L	2 58 57.07	69.89	+22 12 54.4	15 33.64	57 06.59
10	S I U	3 27 28.00	70.19	23 47 27.8	15 26.59	56 40.71
11	II L	3 56 11.29	70.39	25 01 02.4	15 20.00	56 16.53
11	S I U	4 25 01.06	70.43	25 53 01.5	15 13.93	55 54.24
12	II L	4 53 49.83	70.30	26 23 09.9	15 08.41	55 33.97
12	S I U	5 22 29.24	69.98	+26 31 35.2	15 03.45	55 15.78
13	II L	5 50 50.76	69.48	26 18 47.1	14 59.07	54 59.69
13	N I U	6 18 46.52	68.81	25 45 35.7	14 55.24	54 45.65
14	II L	6 46 09.84	68.01	24 53 08.8	14 51.96	54 33.61
14	N I U	7 12 55.78	67.12	+23 42 48.0	14 49.20	54 23.49

Feb. 12 U Defective Illumination of N 0°.46

Feb. 13 U Defective Illumination of S 0°.98

MOON, 1935

AT TRANSIT AT GREENWICH

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
Feb. 14	N I U	^{h m s} 7 12 55.78	67.12	+23 42 48.0	14 49.20	54 23.49
15	IL	7 39 01.36	66.18	22 16 04.4	14 46.94	54 15.18
15	N I U	8 04 25.48	65.23	20 34 34.7	14 45.15	54 08.59
16	IL	8 29 08.89	64.30	18 39 58.4	14 43.79	54 03.62
16	N I U	8 53 13.85	63.43	16 33 54.3	14 42.85	54 00.18
17	IL	9 16 43.90	62.66	+14 17 59.4	14 42.31	53 58.19
17	S I U	9 39 43.57	62.00	11 53 47.8	14 42.14	53 57.58
18	IL	10 02 18.16	61.48	9 22 49.8	14 42.35	53 58.33
19	S II U	10 24 33.52	61.10	6 46 32.9	14 42.92	54 00.42
19	II L	10 46 35.99	60.88	4 06 21.3	14 43.85	54 03.84
20	S II U	11 08 32.19	60.82	+ 1 23 37.3	14 45.15	54 08.62
20	II L	11 30 29.03	60.94	- 1 20 17.3	14 46.84	54 14.80
21	S II U	11 52 33.65	61.24	4 04 01.1	14 48.92	54 22.44
21	II L	12 14 53.36	61.72	6 46 10.5	14 51.41	54 31.60
22	S II U	12 37 35.66	62.36	9 25 18.9	14 54.35	54 42.37
22	II L	13 00 47.99	63.18	-11 59 54.3	14 57.74	54 54.82
23	S II U	13 24 37.79	64.16	14 28 17.4	15 01.61	55 09.03
23	II L	13 49 12.31	65.29	16 48 41.5	15 05.98	55 25.05
24	S II U	14 14 38.09	66.53	18 59 09.0	15 10.85	55 42.95
24	II L	14 41 00.67	67.85	20 57 32.0	15 16.23	56 02.71
25	S II U	15 08 24.09	69.22	-22 41 32.9	15 22.11	56 24.29
25	II L	15 36 50.10	70.56	24 08 45.6	15 28.47	56 47.60
26	S II U	16 06 17.63	71.82	25 16 40.5	15 35.25	57 12.48
26	II L	16 36 42.12	72.92	26 02 51.8	15 42.38	57 38.68
27	S II U	17 07 55.42	73.80	26 25 06.0	15 49.79	58 05.86
27	II L	17 39 45.93	74.40	-26 21 34.2	15 57.34	58 33.59
28	N II U	18 11 59.51	74.69	25 51 02.4	16 04.90	59 01.33
28	II L	18 44 20.82	74.66	24 53 01.4	16 12.28	59 28.43
Mar. 1	N II U	19 16 34.95	74.34	23 27 51.9	16 19.30	59 54.19
1	II L	19 48 29.05	73.80	21 36 45.9	16 25.75	60 17.86
2	II U	20 19 53.38	73.08	-19 21 42.7	16 31.41	60 38.65
2	II L	20 50 42.03	72.29	16 45 21.9	16 36.09	60 55.81
3	II U	21 20 52.88	71.48	13 50 55.4	16 39.60	61 08.69
3	II L	21 50 27.16	70.73	10 41 57.4	16 41.79	61 16.72
4	II U	22 19 28.81	70.09	7 22 16.3	16 42.56	61 19.54
5	II L	22 48 03.72	69.59	- 3 55 47.2	16 41.86	61 16.97
5	I U	23 16 19.01	69.25	- 0 26 24.5	16 39.70	61 09.06
6	IL	23 44 22.38	69.09	+ 3 02 02.4	16 36.16	60 56.06
6	I U	0 12 21.54	69.10	6 25 54.3	16 31.36	60 38.44
7	IL	0 40 23.65	69.25	9 41 45.6	16 25.46	60 16.80
7	I U	1 08 34.95	69.53	+12 46 26.7	16 18.67	59 51.86
8	IL	1 37 00.22	69.90	15 37 06.6	16 11.19	59 24.42
8	S I U	2 05 42.45	70.30	18 11 14.3	16 03.25	58 55.27
9	IL	2 34 42.48	70.70	20 26 41.3	15 55.06	58 25.21
9	S I U	3 03 58.78	71.04	+22 21 42.8	15 46.82	57 54.97

Feb. 17 U Defective Illumination of N 0°.07

Feb. 19 U Defective Illumination of I 0°.19

MOON, 1935

AT TRANSIT AT GREENWICH

167

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
Mar. 9	S I U	^{h m} 3 03 58.78 1768.66	71.04	+22 21 42.8 5597.0	15 46.82	57 54.97
10	I L	3 33 27.44 1774.90	71.27	23 54 59.8+ 4240.7	15 38.71	57 25.21
10	S I U	4 03 02.34 1773.31	71.34	25 05 40.5 2861.1	15 30.88	56 56.47
11	I L	4 32 35.65 1762.89	71.23	25 53 21.6 1485.9	15 23.46	56 29.24
11	S I U	5 01 58.54 1743.39	70.92	26 18 07.5+ 141.5	15 16.56	56 03.89
12	I L	5 31 01.93 1715.50	70.42	+26 20 29.0 1148.9	15 10.24	55 40.70
12	N I U	5 59 37.43 1680.55	69.75	26 01 20.1 2367.1	15 04.56	55 19.86
13	I L	6 27 37.98 1640.38	68.92	25 21 53.0 3498.9	14 59.56	55 01.49
13	N I U	6 54 58.36 1597.10	67.99	24 23 34.1 4536.2	14 55.24	54 45.63
14	I L	7 21 35.46 1552.67	66.99	23 07 57.9 5474.4	14 51.60	54 32.30
14	N I U	7 47 28.13 1509.08	65.98	+21 36 43.5 6312.9	14 48.65	54 21.45
15	I L	8 12 37.21 1467.88	64.99	19 51 30.6 7054.0	14 46.35	54 13.00
15	N I U	8 37 05.09 1430.39	64.06	17 53 56.6 7700.2	14 44.67	54 06.84
16	I L	9 00 55.48 1397.53	63.21	15 45 36.4 8255.8	14 43.58	54 02.84
16	N I U	9 24 13.01 1370.11	62.47	13 28 00.6 8724.4	14 43.04	54 00.88
17	I L	9 47 03.12 1348.62	61.87	+11 02 36.2 9108.9	14 43.02	54 00.80
17	N I U	10 09 31.74 1333.43	61.40	8 30 47.3 9411.8	14 43.47	54 02.46
18	I L	10 31 45.17 1324.80	61.09	5 53 55.5 9633.5	14 44.36	54 05.72
18	N I U	10 53 49.97 1322.93	60.95	3 13 22.0 9774.3	14 45.65	54 10.46
19	I L	11 15 52.90 1327.95	60.97	+ 0 30 27.7 9832.4	14 47.31	54 16.54
19	S I U	11 38 00.85 1339.95	61.16	- 2 13 24.7 9805.0	14 49.31	54 23.86
20	I L	12 00 20.80 1358.96	61.53	4 56 49.7 9687.7	14 51.62	54 32.35
21	S II U	12 22 59.76 1384.93	62.06	7 38 17.4 9475.1	14 54.23	54 41.92
21	I L	12 46 04.69 1417.72	62.75	10 16 12.5 9161.3	14 57.12	54 52.55
22	S II U	13 09 42.41 1456.98	63.60	12 48 53.8 8738.0	15 00.29	55 04.18
22	I L	13 33 59.39 1502.16	64.58	-15 14 31.8 8198.1	15 03.73	55 16.81
23	S II U	13 59 01.55 1552.17	65.68	17 31 09.9 7533.0	15 07.45	55 30.45
23	I L	14 24 53.72 1605.70	66.86	19 36 42.9 6736.7	15 11.44	55 45.11
24	S II U	14 51 39.42 1660.86	68.09	21 28 59.6 5804.2	15 15.72	56 00.80
24	I L	15 19 20.28 1715.19	69.30	23 05 43.8 4735.4	15 20.27	56 17.53
25	S II U	15 47 55.47 1765.89	70.46	-24 24 39.2 3534.8	15 25.11	56 35.29
25	I L	16 17 21.36 1809.98	71.49	25 23 34.0 2214.8	15 30.22	56 54.05
26	S II U	16 47 31.34 1844.60	72.34	26 00 28.8 795.6	15 35.59	57 13.75
26	I L	17 18 15.94 1867.56	72.95	26 13 44.4+ 695.0	15 41.19	57 34.29
27	S II U	17 49 23.50 1877.71	73.31	26 02 09.4 2222.4	15 46.96	57 55.49
27	I L	18 20 41.21 1875.11	73.39	-25 25 07.0 3748.1	15 52.86	58 17.12
28	N II U	18 51 56.32 1861.14	73.21	24 22 38.9+ 5233.5	15 58.79	58 38.89
28	I L	19 22 57.46 1838.19	72.81	22 55 25.4 6641.2	16 04.65	59 00.41
29	N II U	19 53 35.65 1809.30	72.25	21 04 44.2 7939.1	16 10.33	59 21.25
29	I L	20 23 44.95 1777.73	71.59	18 52 25.1 9100.0	16 15.68	59 40.89
30	N II U	20 53 22.68 1746.48	70.90	-16 20 45.1 10102.3	16 20.56	59 58.80
30	I L	21 22 29.16 1718.16	70.24	13 32 22.8+ 10929.3	16 24.81	60 14.41
31	II U	21 51 07.32 1694.88	69.66	10 30 13.5 11567.8	16 28.28	60 27.15
31	I L	22 19 22.20 1678.06	69.19	7 17 25.7+ 12008.4	16 30.83	60 36.50
Apr. 1	II U	22 47 20.26	68.88	- 3 57 17.3	16 32.33	60 42.01

Mar. 12 U Defective Illumination of S 0°.01
Mar. 18 U Defective Illumination of S 0°.27

Mar. 19 U Defective Illumination of II 0°.15
Mar. 27 U Defective Illumination of N 0°.34

MOON, 1935

AT TRANSIT AT GREENWICH

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
Apr. 1	II L	^{h m s} 23 15 08.89 1666.97	68.74	- 0 33 13.0	16 32.69	60 43.33
2	II U	23 42 55.86 1672.98	68.76	+ 2 51 18.0	16 31.85	60 40.24
2	II L	0 10 48.84 1686.00	68.95	6 12 45.8	16 29.80	60 32.72
3	II U	0 38 54.84 1704.98	69.29	9 27 42.1	16 26.57	60 20.88
4	I L	1 07 19.82 1728.29	69.75	12 32 44.5	16 22.24	60 04.99
4	I U	1 36 08.11 1753.81	70.28	+15 24 40.4	16 16.93	59 45.50
5	I L	2 05 21.92 1778.87	70.84	18 00 32.6	16 10.79	59 22.96
5	I U	2 35 00.89 1801.00	71.36	20 17 43.5	16 03.99	58 57.98
6	I L	3 05 01.89 1817.00	71.79	22 14 01.5	15 56.71	58 31.26
6	I U	3 35 18.89 1824.46	72.07	23 47 45.2	15 49.14	58 03.50
7	I L	4 05 43.35 1821.55	72.16	+24 57 48.5	15 41.48	57 35.38
7	S I U	4 36 04.90 1807.38	72.02	25 43 42.0	15 33.90	57 07.55
8	I L	5 06 12.28 1782.21	71.64	26 05 33.4	15 26.55	56 40.58
8	S I U	5 35 54.49 1747.30	71.04	26 04 04.3	15 19.57	56 14.97
9	I L	6 05 01.79 1704.74	70.24	25 40 24.7	15 13.08	55 51.12
9	N I U	6 33 26.53 1657.08	69.29	+24 56 05.4	15 07.15	55 29.38
10	I L	7 01 03.61 1606.94	68.24	23 52 51.6	15 01.87	55 09.99
10	N I U	7 27 50.55 1556.73	67.14	22 32 34.8	14 57.28	54 53.14
11	I L	7 53 47.28 1508.61	66.04	20 57 07.4	14 53.41	54 38.93
11	N I U	8 18 55.89 1464.19	64.98	19 08 18.2	14 50.28	54 27.43
12	I L	8 43 20.08 1424.75	64.01	+17 07 50.2	14 47.88	54 18.64
12	N I U	9 07 04.83 1391.18	63.14	14 57 19.5	14 46.21	54 12.51
13	I L	9 30 16.01 1364.12	62.41	12 38 15.1	14 45.25	54 08.97
13	N I U	9 53 00.13 1343.92	61.82	10 12 00.4	14 44.96	54 07.92
14	I L	10 15 24.05 1330.84	61.40	7 39 53.8	14 45.32	54 09.22
14	N I U	10 37 34.89 1325.09	61.14	+ 5 03 11.2	14 46.27	54 12.71
15	I L	10 59 39.98 1326.70	61.05	+ 2 23 07.2	14 47.77	54 18.23
15	N I U	11 21 46.68 1335.77	61.14	- 0 19 02.3	14 49.78	54 25.61
16	I L	11 44 02.45 1352.29	61.41	3 01 58.2	14 52.23	54 34.61
16	N I U	12 06 34.74 1376.19	61.86	5 44 16.6	14 55.08	54 45.04
17	I L	12 29 30.93 1407.29	62.48	- 8 24 27.1	14 58.26	54 56.71
17	S I U	12 52 58.22 1445.28	63.26	11 00 50.5	15 01.72	55 09.42
18	I L	13 17 03.50 1489.52	64.19	13 31 38.7	15 05.41	55 22.98
18	S I U	13 41 53.02 1539.10	65.24	15 54 53.1	15 09.28	55 37.20
19	II L	14 07 32.12 1592.65	66.39	18 08 25.0	15 13.29	55 51.92
20	S II U	14 34 04.77 1648.15	67.60	-20 09 57.2	15 17.40	56 06.99
20	II L	15 01 32.92 1703.20	68.81	21 57 06.5	15 21.57	56 22.30
21	S II U	15 29 56.12 1754.85	69.97	23 27 27.6	15 25.78	56 37.73
21	II L	15 59 10.97 1799.93	71.02	24 38 40.2	15 30.00	56 53.24
22	S II U	16 29 10.90 1835.35	71.90	25 28 36.6	15 34.22	57 08.72
22	II L	16 59 46.25 1858.70	72.54	-25 55 30.5	15 38.42	57 24.12
23	S II U	17 30 44.95 1868.54	72.92	25 58 05.3	15 42.58	57 39.41
23	II L	18 01 53.49 1864.83	73.01	25 35 41.2	15 46.70	57 54.52
24	N II U	18 32 58.32 1848.83	72.83	24 48 17.5	15 50.76	58 09.41
24	II L	19 03 47.15 1848.83	72.42	-23 36 33.4	15 54.72	58 23.99

Apr. 17 U Defective Illumination of N 0°-20
 Apr. 18 U Defective Illumination of II 0°-00

Apr. 24 U Defective Illumination of S 0°-49

MOON, 1935

AT TRANSIT AT GREENWICH

169

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
Apr. 24	II L	^{h m s} 19 03 47.15 1823.01	72.42	^{° ' "} -23 36 33.4	15 54.72	58 23.99
25	N II U	19 34 10.16 1790.52	71.82	22 01 43.8+ 5689.6	15 58.58	58 38.15
25	II L	20 04 00.68 1754.76	71.12	20 05 32.9 6970.9	16 02.29	58 51.75
26	N II U	20 33 15.44 1718.92	70.36	17 50 07.2 8125.7	16 05.79	59 04.61
26	II L	21 01 54.36 1685.84	69.62	15 17 49.4 9137.8	16 09.04	59 16.52
27	N II U	21 30 00.20 1657.76	68.94	-12 31 12.2 +10696.5	16 11.96	59 27.23
27	II L	21 57 37.96 1636.28	68.39	9 32 55.7+ 11231.0	16 14.47	59 36.45
28	N II U	22 24 54.24 1622.59	67.98	6 25 44.7 11596.5	16 16.49	59 43.86
28	II L	22 51 56.83 1617.27	67.74	- 3 12 28.2 11789.3	16 17.93	59 49.16
29	N II U	23 18 54.10 1620.52	67.69	+ 0 04 01.1 11804.8	16 18.72	59 52.05
29	II L	23 45 54.62 1632.12	67.82	+ 3 20 45.9+ 11639.3	16 18.78	59 52.27
30	II U	0 13 06.74 1651.45	68.12	6 34 45.2+ 11289.3	16 18.05	59 49.58
30	II L	0 40 38.19 1677.35	68.59	9 42 54.5 10753.7	16 16.49	59 43.86
May 1	II U	1 08 35.54 1708.11	69.17	12 42 08.2 10033.4	16 14.09	59 35.06
1	II L	1 37 03.65 1741.61	69.84	15 29 21.6 9134.7	16 10.87	59 23.22
2	II U	2 06 05.26 1775.02	70.54	+18 01 36.3+ 8069.5	16 06.86	59 08.51
2	II L	2 35 40.28 1805.18	71.21	20 16 05.8+ 6857.2	16 02.13	58 51.18
3	I U	3 05 45.46 1828.79	71.78	22 10 23.0 5524.7	15 56.79	58 31.58
4	I L	3 36 14.25 1842.79	72.19	23 42 27.7 4106.1	15 50.96	58 10.16
4	I U	4 06 57.04 1844.87	72.37	24 50 53.8 2641.3	15 44.76	57 47.39
5	I L	4 37 41.91 1833.79	72.31	+25 34 55.1+ 11172.0	15 38.33	57 23.81
5	I U	5 08 15.70 1809.71	71.98	25 54 27.1- 261.4	15 31.83	56 59.93
6	II L	5 38 25.41 1773.98	71.39	25 50 05.7- 1623.6	15 25.39	56 36.29
6	N I U	6 07 59.39 1729.10	70.57	25 23 02.1 2888.1	15 19.14	56 13.38
7	II L	6 36 48.49 1678.01	69.59	24 34 54.0 4037.3	15 13.22	55 51.64
7	N I U	7 04 46.50 1623.84	68.49	+23 27 36.7- 5062.8	15 07.72	55 31.45
8	II L	7 31 50.34 1569.45	67.34	22 03 13.9- 5963.6	15 02.74	55 13.16
8	N I U	7 57 59.79 1517.32	66.18	20 23 50.3 6744.2	14 58.35	54 57.05
9	II L	8 23 17.11 1469.33	65.07	18 31 26.1 7413.0	14 54.61	54 43.32
9	N I U	8 47 46.44 1426.87	64.05	16 27 53.1 7978.9	14 51.56	54 32.14
10	II L	9 11 33.31 1390.96	63.16	+14 14 54.2- 8452.0	14 49.24	54 23.63
10	N I U	9 34 44.27 1362.21	62.40	11 54 02.2 8840.7	14 47.67	54 17.85
11	II L	9 57 26.48 1341.04	61.81	9 26 41.5 9152.0	14 46.84	54 14.82
11	N I U	10 19 47.52 1327.67	61.38	6 54 09.5 9390.6	14 46.76	54 14.53
12	II L	10 41 55.19 1322.30	61.14	4 17 38.9 9558.7	14 47.41	54 16.90
12	N I U	11 03 57.49 1324.99	61.09	+ 1 38 20.2- 9656.6	14 48.76	54 21.84
13	II L	11 26 02.48 1335.85	61.22	- 1 02 36.4- 9681.5	14 50.77	54 29.22
13	N I U	11 48 18.33 1354.83	61.54	3 43 57.9 9627.7	14 53.40	54 38.88
14	II L	12 10 53.16 1381.92	62.05	6 24 25.6 9488.3	14 56.59	54 50.61
14	N I U	12 33 55.08 1416.94	62.74	9 02 33.9 9252.6	15 00.29	55 04.19
15	I L	12 57 32.02 1459.53	63.61	-11 36 46.5- 8909.2	15 04.43	55 19.36
15	N I U	13 21 51.55 1508.98	64.62	14 05 15.7 8444.6	15 08.91	55 35.83
16	II L	13 47 00.53 1564.18	65.76	16 26 00.3 7845.7	15 13.67	55 53.30
16	N I U	14 13 04.71 1623.51	67.00	18 36 46.0- 7100.2	15 18.62	56 11.46
17	II L	14 40 08.22	68.29	-20 35 06.2	15 23.66	56 29.97

May 16 U Defective Illumination of S 0°.05

(330/3544)

(NAUTICAL ALMANAC, 1935)

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MOON, 1935

AT TRANSIT AT GREENWICH

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
May 17	I L	^{h m s} 14 40 08.22 1684.56	68.29	-20 35 06.2 - 6199.1	15 23.66	56 29.97
17	S I U	15 08 12.78 1744.38	69.58	22 18 25.3 5140.1	15 28.72	56 48.52
18	I L	15 37 17.16 1799.34	70.79	23 44 05.4 3928.0	15 33.70	57 06.79
19	S I U	16 07 16.50 1845.68	71.85	24 49 33.4 2579.0	15 38.52	57 24.49
19	I L	16 38 02.18 1879.84	72.69	25 32 32.4 1121.0	15 43.11	57 41.35
20	S I U	17 09 22.02 1899.18	73.26	-25 51 13.4 + 407.8	15 47.41	57 57.15
20	I L	17 41 01.20 1902.54	73.52	25 44 25.6 1961.7	15 51.38	58 11.70
21	S I U	18 12 43.74 1890.37	73.45	25 11 43.9 3492.4	15 54.97	58 24.87
21	I L	18 44 14.11 1864.83	73.09	24 13 31.5 4953.8	15 58.16	58 36.59
22	N I U	19 15 18.94 1829.22	72.49	22 50 57.7 6307.9	16 00.94	58 46.80
22	I L	19 45 48.16 1787.44	71.72	-21 05 49.8 + 7526.2	16 03.32	58 55.51
23	N I U	20 15 35.60 1743.43	70.84	19 00 23.6 8589.3	16 05.29	59 02.75
23	I L	20 44 39.03 1700.67	69.95	16 37 14.3 9488.0	16 06.87	59 08.55
24	N I U	21 12 59.70 1662.04	69.10	13 59 06.3 10219.0	16 08.07	59 12.97
24	I L	21 40 41.74 1629.64	68.35	11 08 47.3 10783.2	16 08.91	59 16.05
25	N I U	22 07 51.38 1605.03	67.73	- 8 09 04.1 + 11183.5	16 09.39	59 17.81
25	I L	22 34 36.41 1589.06	67.28	5 02 40.6 11422.9	16 09.51	59 18.27
26	N I U	23 01 05.47 1582.26	67.03	- 1 52 17.7 11503.9	16 09.28	59 17.40
26	I L	23 27 27.73 1584.65	66.96	+ 1 19 26.2 11427.9	16 08.67	59 15.16
27	N I U	23 53 52.38 1595.94	67.09	4 29 54.1 11193.9	16 07.67	59 11.50
27	I L	0 20 28.32 1615.44	67.41	+ 7 36 28.0 + 10800.7	16 06.27	59 06.36
28	N I U	0 47 23.76 1642.07	67.88	10 36 28.7 10246.7	16 04.45	58 59.67
28	I L	1 14 45.83 1674.21	68.49	13 27 15.4 9531.7	16 02.19	58 51.37
29	I U	1 42 40.04 1709.70	69.18	16 06 07.1 8657.8	15 59.48	58 41.43
29	I L	2 11 09.74 1745.88	69.92	18 30 24.9 7631.5	15 56.32	58 29.84
30	I U	2 40 15.62 1779.62	70.64	+20 37 36.4 + 6465.9	15 52.73	58 16.65
30	I L	3 09 55.24 1807.52	71.27	22 25 22.3 5181.5	15 48.72	58 01.93
31	I U	3 40 02.76 1826.37	71.74	23 51 43.8 3806.9	15 44.34	57 45.85
31	I L	4 10 29.13 1833.51	72.00	24 55 10.7 2377.3	15 39.63	57 28.59
June 1	I U	4 41 02.64 1827.39	72.01	25 34 48.0 + 932.8	15 34.68	57 10.40
2	I L	5 11 30.03 1807.73	71.75	+25 50 20.8 - 486.4	15 29.55	56 51.59
2	I U	5 41 37.76 1775.66	71.23	25 42 14.4 1843.7	15 24.34	56 32.47
3	I L	6 11 13.42 1733.38	70.47	25 11 30.7 3107.8	15 19.15	56 13.39
3	I U	6 40 06.80 1683.89	69.53	24 19 42.9 4258.5	15 14.06	55 54.71
4	I L	7 08 10.69 1630.34	68.45	23 08 44.4 5283.3	15 09.17	55 36.77
4	I U	7 35 21.03 1575.75	67.30	+21 40 41.1 - 6178.9	15 04.57	55 19.91
5	I L	8 01 36.78 1522.82	66.15	19 57 42.2 6948.0	15 00.36	55 04.45
5	N I U	8 26 59.60 1473.61	65.04	18 01 54.2 7597.9	14 56.61	54 50.68
6	I L	8 51 33.21 1429.66	64.01	15 55 16.3 8138.7	14 53.39	54 38.85
6	N I U	9 15 22.87 1392.11	63.10	13 39 37.6 8580.0	14 50.76	54 29.19
7	I L	9 38 34.98 1361.72	62.34	+11 16 37.6 - 8932.6	14 48.77	54 21.88
7	N I U	10 01 16.70 1338.98	61.74	8 47 45.0 9204.3	14 47.46	54 17.08
8	I L	10 23 35.68 1324.18	61.31	6 14 20.7 9402.0	14 46.86	54 14.89
8	N I U	10 45 39.86 1317.57	61.06	3 37 38.7 9529.8	14 47.00	54 15.40
9	I L	11 07 37.43	61.00	+ 0 58 48.9	14 47.88	54 18.64

May 21 U Defective Illumination of N 0°.37

MOON, 1935

AT TRANSIT AT GREENWICH

171

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
June 9	I L	^{h m s} 11 07 37.43	61.00	+ 0 58 48.9	14 47.88	54 18.64
9	N I U	11 29 36.69	61.14	- 1 41 00.7	14 49.51	54 24.61
10	I L	11 51 46.11	61.47	4 20 40.9	14 51.87	54 33.28
10	N I U	12 14 14.21	62.00	6 58 59.0	14 54.94	54 44.54
11	I L	12 37 09.54	62.72	9 34 35.2	14 58.68	54 58.27
11	N I U	13 00 40.60	63.61	-12 06 00.5	15 03.04	55 14.29
12	I L	13 24 55.60	64.67	14 31 33.9	15 07.97	55 32.37
12	N I U	13 50 02.23	65.88	16 49 20.0	15 13.38	55 52.23
13	I L	14 16 07.11	67.19	18 57 08.4	15 19.19	56 13.54
13	N I U	14 43 15.28	68.56	20 52 33.4	15 25.29	56 35.92
14	I L	15 11 29.44	69.93	-22 32 57.0	15 31.56	56 58.94
14	N I U	15 40 49.07	71.24	23 55 33.9	15 37.88	57 22.13
15	I L	16 11 09.80	72.40	24 57 40.3	15 44.11	57 45.01
15	S I U	16 42 22.98	73.32	25 36 45.6	15 50.12	58 07.06
16	I L	17 14 15.78	73.96	25 50 46.7	15 55.77	58 27.81
17	S II U	17 46 32.17	74.26	-25 38 20.8	16 00.94	58 46.78
17	II L	18 18 54.40	74.20	24 58 56.4	16 05.51	59 03.55
18	S II U	18 51 05.05	73.82	23 52 58.1	16 09.39	59 17.82
18	II L	19 22 48.89	73.17	22 21 44.5	16 12.53	59 29.34
19	N II U	19 53 54.37	72.33	20 27 20.7	16 14.89	59 37.98
19	II L	20 24 14.26	71.38	-18 12 26.6	16 16.45	59 43.70
20	N II U	20 53 45.75	70.40	15 40 03.7	16 17.23	59 46.56
20	II L	21 22 29.90	69.47	12 53 24.2	16 17.27	59 46.71
21	N II U	21 50 30.92	68.64	9 55 41.7	16 16.63	59 44.36
21	II L	22 17 55.29	67.96	6 50 05.4	16 15.37	59 39.76
22	N II U	22 44 51.02	67.45	- 3 39 36.4	16 13.57	59 33.17
22	II L	23 11 27.04	67.14	- 0 27 06.7	16 11.32	59 24.89
23	N II U	23 37 52.64	67.02	+ 2 44 40.4	16 08.67	59 15.17
23	II L	0 04 17.14	67.10	5 53 08.6	16 05.70	59 04.27
24	N II U	0 30 49.41	67.36	8 55 47.6	16 02.47	58 52.39
24	II L	0 57 37.61	67.77	+11 50 10.8	15 59.01	58 39.72
25	N II U	1 24 48.76	68.31	14 33 55.0	15 55.38	58 26.40
25	II L	1 52 28.26	68.94	17 04 39.6	15 51.61	58 12.54
26	N II U	2 20 39.46	69.60	19 20 08.2	15 47.71	57 58.23
26	II L	2 49 23.23	70.25	21 18 11.9	15 43.70	57 43.52
27	II U	3 18 37.50	70.81	+22 56 53.2	15 39.60	57 28.47
27	II L	3 48 17.12	71.23	24 14 32.6	15 35.43	57 13.14
28	II U	4 18 14.01	71.45	25 09 54.3	15 31.19	56 57.59
28	II L	4 48 17.63	71.44	25 42 12.7	15 26.91	56 41.87
29	II U	5 18 15.96	71.18	25 51 16.4	15 22.61	56 26.08
29	II L	5 47 56.67	70.68	+25 37 29.1	15 18.32	56 10.34
30	II U	6 17 08.25	69.95	25 01 48.0	15 14.08	55 54.78
July 1	I L	6 45 41.08	69.05	24 05 38.3	15 09.93	55 39.55
1	I U	7 13 28.12	68.03	22 50 46.3	15 05.92	55 24.83
2	I L	7 40 25.21	66.94	+21 19 11.2	15 02.10	55 10.81

June 14 U Defective Illumination of S 0°.10
 June 15 U Defective Illumination of N 1°.05

June 17 U Defective Illumination of I 0°.05
 June 18 U Defective Illumination of N 0°.03

MOON, 1935

AT TRANSIT AT GREENWICH

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
July 2	I U	^{h m s} 8 06 30.95	65.83	+19 32 58.2	14 58.52	54 57.69
3	IL	8 31 46.43	64.76	17 34 11.7	14 55.25	54 45.68
3	I U	8 56 14.76	63.78	15 24 51.2	14 52.34	54 35.01
4	IL	9 20 00.61	62.90	13 06 48.5	14 49.86	54 25.90
4	I U	9 43 09.78	62.15	10 41 46.1	14 47.85	54 18.53
5	IL	10 05 48.86	61.56	+ 8 11 18.0	14 46.37	54 13.10
5	N I U	10 28 05.03	61.14	5 36 49.1	14 45.47	54 09.80
6	IL	10 50 05.79	60.89	2 59 37.5	14 45.20	54 08.78
6	N I U	11 11 58.93	60.83	+ 0 20 56.1	14 45.58	54 10.18
7	IL	11 33 52.44	60.96	- 2 18 04.9	14 46.65	54 14.11
7	N I U	11 55 54.47	61.28	- 4 56 16.5	14 48.43	54 20.66
8	IL	12 18 13.33	61.78	7 32 27.2	14 50.95	54 29.89
8	N I U	12 40 57.37	62.48	10 05 21.3	14 54.19	54 41.80
9	IL	13 04 14.99	63.36	12 33 35.6	14 58.16	54 56.36
9	N I U	13 28 14.43	64.40	14 55 37.2	15 02.82	55 13.48
10	IL	13 53 03.55	65.59	-17 09 40.4	15 08.15	55 33.03
10	N I U	14 18 49.35	66.90	19 13 45.5	15 14.09	55 54.82
11	IL	14 45 37.53	68.28	21 05 37.8	15 20.56	56 18.57
11	N I U	15 13 31.80	69.68	22 42 49.0	15 27.47	56 43.94
12	IL	15 42 32.97	71.04	24 02 41.0	15 34.71	57 10.52
12	N I U	16 12 38.32	72.27	-25 02 32.5	15 42.14	57 37.81
13	IL	16 43 40.96	73.31	25 39 49.2	15 49.62	58 05.24
13	S I U	17 15 29.77	74.07	25 52 17.5	15 56.96	58 32.17
14	IL	17 47 50.03	74.50	25 38 18.6	16 03.98	58 57.94
14	S I U	18 20 24.66	74.59	24 57 00.7	16 10.50	59 21.87
15	IL	18 52 56.12	74.35	-23 48 28.0	16 16.34	59 43.30
15	S I U	19 25 08.39	73.81	22 13 42.7	16 21.33	60 01.64
16	IL	19 56 48.57	73.06	20 14 40.5	16 25.35	60 16.39
17	N I U	20 27 47.90	72.19	17 54 00.8	16 28.29	60 27.17
17	IL	20 58 02.00	71.25	15 14 54.8	16 30.09	60 33.77
18	N I U	21 27 30.59	70.35	-12 20 52.3	16 30.73	60 36.14
18	IL	21 56 16.72	69.53	9 15 30.2	16 30.25	60 34.37
19	N I U	22 24 26.04	68.85	6 02 25.1	16 28.70	60 28.70
19	IL	22 52 05.84	68.33	- 2 45 06.0	16 26.19	60 19.48
20	N I U	23 19 24.49	68.00	+ 0 33 09.2	16 22.84	60 07.16
20	IL	23 46 30.79	67.85	+ 3 49 14.3	16 18.77	59 52.24
21	N I U	0 13 33.47	67.89	7 00 15.6	16 14.14	59 35.23
21	IL	0 40 40.81	68.09	10 03 31.6	16 09.08	59 16.65
22	N I U	1 08 00.23	68.44	12 56 31.0	16 03.72	58 56.98
22	IL	1 35 37.89	68.89	15 36 52.7	15 58.18	58 36.65
23	N I U	2 03 38.30	69.41	+18 02 25.2	15 52.57	58 16.05
23	IL	2 32 03.86	69.94	20 11 07.0	15 46.97	57 55.50
24	N I U	3 00 54.59	70.43	22 01 09.4	15 41.45	57 35.26
24	IL	3 30 07.84	70.83	23 30 59.3	15 36.07	57 15.53
25	N I U	3 59 38.29	71.09	+24 39 22.3	15 30.87	56 56.44

July 13 U Defective Illumination of N 0°.13
 July 15 U Defective Illumination of II 0°.09

July 15 U Defective Illumination of N 0°.38
 July 17 U Defective Illumination of S 1°.28

MOON, 1935

AT TRANSIT AT GREENWICH

173

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
July 25	N II U	^{h m s} 3 59 38.29 1779.91	71.09	+24 39 22.3 2766.2	15 30.87	56 56.44
25	II L	4 29 18.20 1779.86	71.16	25 25 28.5 1406.5	15 25.88	56 38.11
26	N II U	4 58 58.06 1769.27	71.02	25 48 55.0 53.6	15 21.11	56 20.59
26	II L	5 28 27.33 1748.22	70.65	25 49 48.6 1263.9	15 16.57	56 03.94
27	II U	5 57 35.55 1717.67	70.07	25 28 44.7 2518.6	15 12.28	55 48.18
27	II L	6 26 13.22 1679.41	69.31	+24 46 46.1 3688.5	15 08.22	55 33.30
28	II U	6 54 12.63 1635.67	68.40	23 45 17.6 4757.2	15 04.42	55 19.33
28	II L	7 21 28.30 1588.91	67.40	22 26 00.4 5713.8	15 00.87	55 06.30
29	II U	7 47 57.21 1542.43	66.35	20 50 46.6 6553.9	14 57.58	54 54.23
29	II L	8 13 38.64 1495.31	65.30	19 01 32.7 7277.4	14 54.56	54 43.15
30	I U	8 38 33.95 1452.23	64.30	+17 00 15.3 7887.1	14 51.83	54 33.13
31	II L	9 02 46.18 1413.53	63.37	14 48 48.2 8389.1	14 49.42	54 24.26
Aug. 31	I U	9 26 19.71 1380.15	62.55	12 28 59.1 8789.9	14 47.34	54 16.63
1	II L	9 49 19.86 1352.82	61.85	10 02 29.2 9096.8	14 45.62	54 10.32
1	I U	10 11 52.68 1332.03	61.31	7 30 52.4 9315.8	14 44.30	54 05.48
2	II L	10 34 04.71 1318.08	60.92	+ 4 55 36.6 9453.6	14 43.41	54 02.23
2	I U	10 56 02.79 1311.28	60.70	+ 2 18 03.0 9513.9	14 43.00	54 00.73
3	II L	11 17 54.07 1311.78	60.66	- 0 20 30.9 9500.1	14 43.10	54 01.10
3	I U	11 39 45.85 1319.76	60.79	2 58 51.0 9413.0	14 43.75	54 03.48
4	II L	12 01 45.61 1335.27	61.10	5 35 44.0 9252.1	14 44.99	54 08.02
4	N I U	12 24 00.88 1358.43	61.59	- 8 09 56.1 9014.2	14 46.85	54 14.84
5	II L	12 46 39.31 1389.22	62.25	10 40 10.3 8694.4	14 49.35	54 24.04
5	N I U	13 09 48.53 1427.51	63.08	13 05 04.7 8285.3	14 52.53	54 35.71
6	II L	13 33 36.04 1472.89	64.06	15 23 10.0 7777.5	14 56.40	54 49.89
6	N I U	13 58 08.93 1524.72	65.18	17 32 47.5 7160.5	15 00.95	55 06.61
7	II L	14 23 33.65 1581.85	66.41	-19 32 08.0 6422.6	15 06.19	55 25.83
7	N I U	14 49 55.50 1642.57	67.71	21 19 10.6 5552.5	15 12.08	55 47.47
8	II L	15 17 18.07 1704.60	69.03	22 51 43.1 4542.1	15 18.60	56 11.37
8	N I U	15 45 42.67 1764.98	70.33	24 07 25.2 3387.8	15 25.67	56 37.32
9	II L	16 15 07.65 1820.22	71.54	25 03 53.0 2093.8	15 33.20	57 04.99
9	N I U	16 45 27.87 1866.84	72.57	-25 38 46.8 674.1	15 41.10	57 33.97
10	II L	17 16 34.71 1901.57	73.38	25 50 00.9 845.6	15 49.22	58 03.76
10	S I U	17 48 16.28 1922.15	73.91	25 35 55.3 2428.2	15 57.39	58 33.75
11	II L	18 20 18.43 1927.72	74.14	24 55 27.1 4027.4	16 05.42	59 03.24
11	S I U	18 52 26.15 1918.97	74.07	23 48 19.7 5592.2	16 13.12	59 31.50
12	II L	19 24 25.12 1898.13	73.73	-22 15 07.5 7071.5	16 20.26	59 57.71
12	S I U	19 56 03.25 1868.48	73.19	20 17 16.0 8419.0	16 26.63	60 21.10
13	II L	20 27 11.73 1833.71	72.50	17 56 57.0 9596.4	16 32.03	60 40.92
13	S I U	20 57 45.44 1797.47	71.75	15 17 00.6 10574.9	16 36.28	60 56.51
14	II L	21 27 42.91 1762.97	71.00	12 20 45.7 11335.5	16 39.24	61 07.37
15	N II U	21 57 05.88 1732.77	70.32	- 9 11 50.2 11868.8	16 40.82	61 13.17
15	II L	22 25 58.65 1708.66	69.76	5 54 01.4 12172.8	16 40.98	61 13.77
16	N II U	22 54 27.31 1691.76	69.34	- 2 31 08.6 12251.5	16 39.75	61 09.25
16	II L	23 22 39.07 1682.61	69.08	+ 0 53 02.9 12113.7	16 37.20	60 59.87
17	N II U	23 50 41.68	68.99	+ 4 14 56.6	16 33.44	60 46.09

Aug. 10 U Defective Illumination of N 0°.19

Aug. 13 U Defective Illumination of N 0°.26

MOON, 1935

AT TRANSIT AT GREENWICH

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
Aug. 17	N II U	^{h m} 23 50 41.68 ^s 1681.13	68.99	+ 4 14 56.6	16 33.44	60 46.09
17	II L	0 18 42.81 ^s 1686.75	69.07	7 31 08.4 ^s 11771.8	16 28.64	60 28.46
18	N II U	0 46 49.56 ^s 1698.53	69.29	10 38 27.9 ^s 11239.5	16 22.97	60 07.64
18	II L	1 15 08.09 ^s 1714.96	69.62	13 34 00.1 ^s 10532.2	16 16.62	59 44.34
19	N II U	1 43 43.05 ^s 1734.22	70.03	16 15 07.1 ^s 9667.0	16 09.79	59 19.28
19	II L	2 12 37.27 ^s 1754.04	70.47	+18 39 28.3 ^s 7533.8	16 02.66	58 53.12
20	N II U	2 41 51.31 ^s 1772.01	70.89	20 45 02.1 ^s 6306.0	15 55.41	58 26.50
20	II L	3 11 23.32 ^s 1785.60	71.24	22 30 08.1 ^s 5001.3	15 48.18	57 59.95
21	N II U	3 41 08.92 ^s 1792.60	71.46	23 53 29.4 ^s 3645.6	15 41.10	57 33.96
21	II L	4 11 01.52 ^s 1791.15	71.52	24 54 15.0 ^s 2266.7	15 34.27	57 08.90
22	N II U	4 40 52.67 ^s 1780.24	71.38	+25 32 01.7 ^s 893.3	15 27.77	56 45.05
22	II L	5 10 32.91 ^s 1759.76	71.03	25 46 55.0 ^s 447.5	15 21.66	56 22.63
23	N II U	5 39 52.67 ^s 1730.39	70.48	25 39 27.5 ^s 1730.2	15 15.99	56 01.80
23	II L	6 08 43.06 ^s 1693.64	69.75	25 10 37.3 ^s 2934.3	15 10.77	55 42.63
24	S II U	6 36 56.70 ^s 1651.44	68.87	24 21 43.0 ^s 4044.8	15 06.01	55 25.17
24	II L	7 04 28.14 ^s 1606.03	67.89	+23 14 18.2 ^s 5050.9	15 01.71	55 09.40
25	II U	7 31 14.17 ^s 1559.53	66.84	21 50 07.3 ^s 5947.8	14 57.87	54 55.29
25	II L	7 57 13.70 ^s 1513.88	65.79	20 10 59.5 ^s 6734.1	14 54.47	54 42.81
26	II U	8 22 27.58 ^s 1470.73	64.76	18 18 45.4 ^s 7411.7	14 51.50	54 31.91
26	II L	8 46 58.31 ^s 1431.37	63.80	16 15 13.7 ^s 7984.2	14 48.94	54 22.52
27	II U	9 10 49.68 ^s 1396.74	62.93	+14 02 09.5 ^s 8456.9	14 46.78	54 14.59
27	II L	9 34 06.42 ^s 1367.60	62.17	11 41 12.6 ^s 8834.4	14 45.00	54 08.07
28	II U	9 56 54.02 ^s 1344.38	61.55	9 13 58.2 ^s 9121.9	14 43.60	54 02.94
28	II L	10 19 18.40 ^s 1327.42	61.07	6 41 56.3 ^s 9323.9	14 42.58	53 59.19
29	I U	10 41 25.82 ^s 1316.93	60.75	4 06 32.4 ^s 9443.7	14 41.94	53 56.83
30	IL	11 03 22.75 ^s 1313.08	60.59	+ 1 29 08.7 ^s 9484.4	14 41.68	53 55.89
30	I U	11 25 15.83 ^s 1315.95	60.59	- 1 08 55.7 ^s 9446.6	14 41.83	53 56.42
31	IL	11 47 11.78 ^s 1325.57	60.75	3 46 22.3 ^s 9330.7	14 42.39	53 58.47
31	I U	12 09 17.35 ^s 1341.99	61.08	6 21 53.0 ^s 9135.5	14 43.39	54 02.13
Sept. 1	IL	12 31 39.34 ^s 1365.13	61.58	8 54 08.5 ^s 8858.3	14 44.85	54 07.50
1	I U	12 54 24.47 ^s 1394.88	62.23	-11 21 46.8 ^s 8495.0	14 46.80	54 14.67
2	IL	13 17 39.35 ^s 1430.91	63.02	13 43 21.8 ^s 8040.1	14 49.27	54 23.73
2	I U	13 41 30.26 ^s 1472.76	63.95	15 57 21.9 ^s 7487.4	14 52.28	54 34.79
3	IL	14 06 03.02 ^s 1519.63	64.98	18 02 09.3 ^s 6829.5	14 55.86	54 47.93
3	N I U	14 31 22.65 ^s 1570.39	66.11	19 55 58.8 ^s 6059.4	15 00.03	55 03.23
4	IL	14 57 33.04 ^s 1623.39	67.28	-21 36 58.2 ^s 5171.1	15 04.80	55 20.72
4	N I U	15 24 36.43 ^s 1676.69	68.46	23 03 09.3 ^s 4161.3	15 10.16	55 40.41
5	IL	15 52 33.12 ^s 1727.83	69.60	24 12 30.6 ^s 3030.2	15 16.11	56 02.26
5	N I U	16 21 20.95 ^s 1774.15	70.65	25 03 00.8 ^s 1784.4	15 22.62	56 26.15
6	IL	16 50 55.10 ^s 1812.98	71.54	25 32 45.2 ^s 437.4	15 29.64	56 51.91
6	N I U	17 21 08.08 ^s 1842.14	72.25	-25 40 02.6 ^s 989.4	15 37.10	57 19.28
7	IL	17 51 50.22 ^s 1860.13	72.72	25 23 33.2 ^s 2467.0	15 44.90	57 47.92
7	S I U	18 22 50.35 ^s 1866.53	72.95	24 42 26.2 ^s 3960.6	15 52.92	58 17.35
8	IL	18 53 56.88 ^s 1862.06	72.94	23 36 25.6 ^s 5431.5	16 01.01	58 47.03
8	S I U	19 24 58.94 ^s	72.72	-22 05 54.1 ^s	16 08.98	59 16.31

Sept. 7 U Defective Illumination of N 1° 24'

MOON, 1935

AT TRANSIT AT GREENWICH

175

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi- diameter	Equa- torial Hori- zontal Parallax
Sept. 8	S I U	^{h m s} 19 24 58.94 1848.47	72.72	-22 05 54.1 + 6839.9	16 08.98	59 16.31
9	I L	19 55 47.41 1828.29	72.33	20 11 54.2 + 8148.4	16 16.65	59 44.46
9	S I U	20 26 15.70 1804.42	71.84	17 56 05.8 9322.6	16 23.80	60 10.69
10	I L	20 56 20.12 1779.75	71.29	15 20 43.2 10332.8	16 30.20	60 34.19
10	S I U	21 25 59.87 1756.86	70.76	12 28 30.4 11153.5	16 35.65	60 54.19
11	I L	21 55 16.73 1737.92	70.30	- 9 22 34.9 + 11771.7	16 39.94	61 09.95
11	S I U	22 24 14.65 1724.49	69.94	6 06 23.2 + 12168.5	16 42.92	61 20.89
12	I L	22 52 59.14 1717.59	69.71	- 2 43 34.7 12337.7	16 44.47	61 26.56
12	N I U	23 21 36.73 1717.67	69.64	+ 0 42 03.0 12277.0	16 44.52	61 26.74
13	I L	23 50 14.40 1724.56	69.71	4 06 40.0 11989.0	16 43.06	61 21.39
14	N I U	0 18 58.96 1737.59	69.94	+ 7 26 29.0 + 11480.8	16 40.15	61 10.72
14	I L	0 47 56.55 1755.54	70.29	10 37 49.8 + 10764.7	16 35.92	60 55.17
15	N I U	1 17 12.09 1776.64	70.72	13 37 14.5 9858.1	16 30.51	60 35.31
15	I L	1 46 48.73 1798.62	71.20	16 21 32.6 8782.5	16 24.11	60 11.83
16	N I U	2 16 47.35 1818.91	71.68	18 47 55.1 7564.4	16 16.95	59 45.54
16	I L	2 47 06.26 1834.74	72.10	+20 53 59.5 + 6233.8	16 09.24	59 17.24
17	N I U	3 17 41.00 1843.53	72.38	22 37 53.3 + 4825.4	16 01.20	58 47.74
17	I L	3 48 24.53 1843.16	72.50	23 58 18.7 3375.3	15 53.03	58 17.76
18	N I U	4 19 07.69 1832.36	72.41	24 54 34.0 1919.9	15 44.92	57 47.99
18	I L	4 49 40.05 1810.86	72.10	25 26 33.9 + 494.0	15 37.02	57 19.00
19	N I U	5 19 50.91 1779.34	71.56	+25 34 47.9 - 872.3	15 29.46	56 51.27
19	I L	5 49 30.25 1739.53	70.81	25 20 15.6 - 2154.6	15 22.35	56 25.16
20	S I U	6 18 29.78 1693.57	69.89	24 44 21.0 3335.8	15 15.76	56 00.97
20	I L	6 46 43.35 1643.94	68.85	23 48 45.2 4405.8	15 09.74	55 38.88
21	S I U	7 14 07.29 1593.11	67.74	22 35 19.4 5360.5	15 04.33	55 19.02
21	I L	7 40 40.40 1543.20	66.61	+21 05 58.9 - 6200.3	14 59.54	55 01.43
22	S I U	8 06 23.60 1495.99	65.50	19 22 38.6 - 6929.1	14 55.37	54 46.12
22	I L	8 31 19.59 1452.86	64.45	17 27 09.5 7552.4	14 51.81	54 33.06
23	S I U	8 55 32.45 1414.79	63.49	15 21 17.1 8077.0	14 48.84	54 22.17
23	I L	9 19 07.24 1382.48	62.64	13 06 40.1 8508.7	14 46.44	54 13.36
24	I U	9 42 09.72 1356.37	61.93	+10 44 51.4 - 8852.6	14 44.59	54 06.54
24	I L	10 04 46.09 1336.69	61.35	8 17 18.8 - 9113.6	14 43.24	54 01.59
25	I U	10 27 02.78 1323.61	60.94	5 45 25.2 9294.4	14 42.37	53 58.40
25	I L	10 49 06.39 1317.19	60.69	3 10 30.8 9396.8	14 41.95	53 56.86
26	I U	11 11 03.58 1317.42	60.59	+ 0 33 54.0 9421.0	14 41.96	53 56.89
26	I L	11 33 01.00 1324.24	60.66	- 2 03 07.0 - 9366.4	14 42.36	53 58.38
27	I U	11 55 05.24 1337.58	60.89	4 39 13.4 - 9230.9	14 43.15	54 01.28
27	I L	12 17 22.82 1357.30	61.28	7 13 04.3 9011.1	14 44.31	54 05.54
28	I U	12 40 00.12 1383.17	61.81	9 43 15.4 8702.8	14 45.83	54 11.12
29	I L	13 03 03.29 1414.83	62.49	12 08 18.2 8301.5	14 47.71	54 18.02
29	I U	13 26 38.12 1451.73	63.30	-14 26 39.7 - 7802.0	14 49.95	54 26.23
30	I L	13 50 49.85 1493.07	64.21	16 36 41.7 7198.5	14 52.56	54 35.81
30	I U	14 15 42.92 1537.81	65.21	18 36 40.2 6486.6	14 55.55	54 46.78
Oct. 1	I L	14 41 20.73 1584.53	66.26	20 24 46.8 5663.3	14 58.93	54 59.19
1	I U	15 07 45.26 167.32	67.32	-21 59 10.1 - 15 02.72	15 02.72	55 13.09

Sept. 11 U Defective Illumination of N 0°.72

Sept. 12 U Defective Illumination of I 0°.00

MOON, 1935

AT TRANSIT AT GREENWICH

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
Oct. 1	I U	^{h m s} 15 07 45.26 1631.47	67.32	-21 59 10.1	15 02.72	55 13.09
2	IL	15 34 56.73 1676.57	68.35	23 17 57.4 4727.3	15 06.93	55 28.54
2	N I U	16 02 53.30 1717.62	69.31	24 19 18.9 3681.5	15 11.56	55 45.56
3	IL	16 31 30.92 1752.46	70.15	25 01 31.7 2532.8	15 16.63	56 04.16
3	N I U	17 00 43.38 1779.25	70.82	25 23 05.7 1294.0	15 22.13	56 24.32
4	IL	17 30 22.63 1796.72	71.31	-25 22 48.1 17.6	15 28.03	56 45.99
4	N I U	18 00 19.35 1804.42	71.59	24 59 49.6 1378.5	15 34.30	57 09.02
5	IL	18 30 23.77 1802.84	71.66	24 13 47.9 2761.7	15 40.90	57 33.22
5	S I U	19 00 26.61 1793.30	71.54	23 04 49.3 4138.6	15 47.74	57 58.35
6	IL	19 30 19.91 1777.83	71.27	21 33 29.6 5479.7	15 54.74	58 24.05
6	S I U	19 59 57.74 1758.76	70.88	-19 40 53.2 6756.4	16 01.78	58 49.87
7	IL	20 29 16.50 1738.65	70.45	17 28 29.9 7943.3	16 08.72	59 15.33
7	S I U	20 58 15.15 1719.81	70.00	14 58 12.7 9017.2	16 15.39	59 39.82
8	IL	21 26 54.96 1704.39	69.61	12 12 15.7 9957.0	16 21.62	60 02.69
8	S I U	21 55 19.35 1694.04	69.30	9 13 11.3 10744.4	16 27.22	60 23.24
9	IL	22 23 33.39 1689.96	69.11	- 6 03 48.7 11362.6	16 32.00	60 40.78
9	S I U	22 51 43.35 1692.97	69.06	- 2 47 12.8 11795.9	16 35.78	60 54.68
10	IL	23 19 56.32 1703.32	69.18	+ 0 33 17.8 12030.6	16 38.41	61 04.33
10	S I U	23 48 19.64 1720.77	69.45	3 54 13.1 12055.3	16 39.76	61 09.27
11	IL	0 17 00.41 1744.56	69.87	7 11 54.3 11861.2	16 39.74	61 09.21
11	N I U	0 46 04.97 1773.22	70.41	+10 22 38.2 11443.9	16 38.33	61 04.03
12	IL	1 15 38.19 1804.70	71.05	13 22 42.5 10804.3	16 35.55	60 53.83
13	N I U	1 45 42.89 1836.32	71.71	16 08 32.4 9949.9	16 31.48	60 38.89
13	IL	2 16 19.21 1864.91	72.35	18 36 48.8 8896.4	16 26.24	60 19.67
14	N I U	2 47 24.12 1887.04	72.90	20 44 36.8 7668.0	16 20.01	59 56.79
14	IL	3 18 51.16 1899.55	73.29	+22 29 34.3 6297.5	16 12.98	59 30.97
15	N I U	3 50 30.71 1899.99	73.46	23 49 59.8 4825.5	16 05.36	59 03.00
15	IL	4 22 10.70 1886.97	73.36	24 44 57.7 3297.9	15 57.36	58 33.66
16	N I U	4 53 37.67 1860.55	73.00	25 14 20.0 1762.3	15 49.21	58 03.73
16	IL	5 24 38.22 1822.13	72.36	25 18 43.4 263.4	15 41.09	57 33.91
17	N I U	5 55 00.35 1774.17	71.49	+24 59 23.6 1159.8	15 33.16	57 04.83
17	IL	6 24 34.52 1719.73	70.44	24 18 05.0 2478.6	15 25.58	56 37.02
18	S I U	6 53 14.25 1662.05	69.27	23 16 51.0 3674.0	15 18.47	56 10.91
18	IL	7 20 56.30 1604.03	68.03	21 57 53.8 4737.2	15 11.92	55 46.86
19	S I U	7 47 40.33 1548.17	66.79	20 23 26.2 5667.6	15 05.99	55 25.10
19	IL	8 13 28.50 1496.40	65.59	+18 35 36.4 7152.6	15 00.74	55 05.81
20	S I U	8 38 24.90 1450.07	64.47	16 36 23.8 7725.7	14 56.18	54 49.10
20	IL	9 02 34.97 1410.10	63.47	14 27 38.1 8199.6	14 52.34	54 35.02
21	S I U	9 26 05.07 1377.06	62.60	12 10 58.5 8582.9	14 49.22	54 23.54
21	IL	9 49 02.13 1351.25	61.89	9 47 55.6 8883.3	14 46.79	54 14.63
22	S I U	10 11 33.38 1332.76	61.33	+ 7 19 52.3 9106.3	14 45.04	54 08.20
22	IL	10 33 46.14 1321.66	60.95	4 48 06.0 9255.3	14 43.93	54 04.15
23	S I U	10 55 47.80 1317.88	60.74	+ 2 13 50.7 9331.8	14 43.44	54 02.34
23	IL	11 17 45.68 1321.30	60.70	- 0 21 41.1 9335.0	14 43.52	54 02.63
24	I U	11 39 46.98	60.83	- 2 57 16.1	14 44.13	54 04.87

Oct. 11 U Defective Illumination of II 0° 24
Oct. 11 U Defective Illumination of S 1° 10

Oct. 17 U Defective Illumination of S 0° 12

MOON, 1935

AT TRANSIT AT GREENWICH

177

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
Oct. 24	II L	^{h m} 12 01 58.81	61.13	— 5 31 39.0	14 45.23	54 08.89
25	II U	12 24 28.03	61.59	8 03 30.0	14 46.76	54 14.53
25	II L	12 47 21.28	62.19	10 31 24.0	14 48.69	54 21.62
26	II U	13 10 44.80	62.94	12 53 49.6	14 50.98	54 30.01
26	II L	13 34 44.24	63.80	15 09 07.9	14 53.58	54 39.57
27	II U	13 59 24.43	64.76	— 17 15 33.2	14 56.47	54 50.17
28	II L	14 24 49.13	65.78	19 11 13.0	14 59.61	55 01.69
28	I U	14 51 00.59	66.82	20 54 10.5	15 02.98	55 14.05
29	I L	15 17 59.20	67.84	22 22 27.1	15 06.56	55 27.18
29	I U	15 45 43.16	68.79	23 34 06.3	15 10.33	55 41.04
30	I L	16 14 08.34	69.63	— 24 27 19.7	15 14.29	55 55.57
30	I U	16 43 08.23	70.31	25 00 32.5	15 18.43	56 10.77
31	I L	17 12 34.27	70.79	25 12 29.5	15 22.75	56 26.63
31	N I U	17 42 16.51	71.05	25 02 20.7	15 27.24	56 43.11
Nov. 1	I L	18 12 04.44	71.10	24 29 44.7	15 31.90	57 00.21
1	S I U	18 41 47.98	70.94	— 23 34 50.1	15 36.72	57 17.88
2	I L	19 11 18.43	70.62	22 18 14.2	15 41.67	57 36.06
2	S I U	19 40 29.16	70.18	20 41 00.6	15 46.73	57 54.63
3	I L	20 09 16.09	69.67	18 44 34.5	15 51.86	58 13.45
3	S I U	20 37 37.78	69.14	16 30 38.7	15 57.00	58 32.32
4	I L	21 05 35.27	68.66	— 14 01 09.6	16 02.09	58 50.99
4	S I U	21 33 11.89	68.25	11 18 14.5	16 07.03	59 09.13
5	I L	22 00 32.73	67.96	8 24 10.5	16 11.72	59 26.34
5	S I U	22 27 44.34	67.82	5 21 23.1	16 16.04	59 42.22
6	I L	22 54 54.28	67.84	— 2 12 27.4	16 19.88	59 56.30
6	S I U	23 22 10.68	68.04	+ 0 59 51.2	16 23.09	60 08.10
7	I L	23 49 41.88	68.42	4 12 37.2	16 25.55	60 17.14
7	S I U	0 17 36.04	68.95	7 22 43.6	16 27.14	60 22.97
8	I L	0 46 00.51	69.63	10 26 53.7	16 27.76	60 25.24
8	S I U	1 15 01.27	70.41	13 21 43.3	16 27.33	60 23.67
9	I L	1 44 42.29	71.24	+ 16 03 45.9	16 25.82	60 18.10
9	N I U	2 15 04.73	72.06	18 29 38.7	16 23.21	60 08.52
10	I L	2 46 06.30	72.80	20 36 12.7	16 19.54	59 55.08
11	N I U	3 17 40.78	73.37	22 20 43.5	16 14.90	59 38.06
11	II L	3 49 38.11	73.71	23 41 02.0	16 09.41	59 17.89
12	N I U	4 21 44.86	73.77	+ 24 35 45.2	16 03.21	58 55.11
12	II L	4 53 45.58	73.51	25 04 21.7	15 56.46	58 30.33
13	N I U	5 25 24.29	72.95	25 07 13.0	15 49.34	58 04.21
13	II L	5 56 26.32	72.10	24 45 28.2	15 42.03	57 37.40
14	S I U	6 26 39.62	71.04	24 00 54.7	15 34.71	57 10.54
14	II L	6 55 55.75	69.82	+ 22 55 45.6	15 27.54	56 44.21
15	S I U	7 24 10.07	68.52	21 32 27.8	15 20.66	56 18.93
15	II L	7 51 21.53	67.22	19 53 30.6	15 14.18	55 55.17
16	S I U	8 17 32.07	65.95	18 01 17.9	15 08.22	55 33.30
16	II L	8 42 45.96	64.76	+ 15 58 02.8	15 02.86	55 13.62

Nov. 9 U Defective Illumination of S 0°.11
 Nov. 11 U Defective Illumination of I 0°.18

Nov. 14 U Defective Illumination of N 0°.42

MOON, 1935

AT TRANSIT AT GREENWICH

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
Nov. 16	II L	^h 8 ^m 42 ^s 45.96 ^a 1463.16	64.76	+15 58 02.8	15 02.86	55 13.62
17	S II U	9 07 09.12 ^a 1419.39	63.70	13 45 46.3 - 7936.5	14 58.16	54 56.36
17	II L	9 30 48.51 ^a 1383.24	62.79	11 26 15.6 8370.7	14 54.17	54 41.71
18	S II U	9 53 51.75 ^a 1355.04	62.04	9 01 05.6 8710.0	14 50.91	54 29.76
18	II L	10 16 26.79 ^a 1334.95	61.47	6 31 41.1 8964.5	14 48.41	54 20.57
19	S II U	10 38 41.74 ^a 1322.93	61.07	+ 3 59 18.8 - 9249.3	14 46.66	54 14.16
19	II L	11 00 44.67 ^a 1318.94	60.87	+ 1 25 09.5 - 9287.8	14 45.66	54 10.50
20	S II U	11 22 43.61 ^a 1322.90	60.84	- 1 09 38.3 9258.6	14 45.39	54 09.51
20	II L	11 44 46.51 ^a 1334.63	61.00	3 43 56.9 9159.3	14 45.82	54 11.08
21	S II U	12 07 01.14 ^a 1353.98	61.33	6 16 36.2 8986.0	14 46.91	54 15.09
21	II L	12 29 35.12 ^a 1380.65	61.84	- 8 46 22.2 - 8731.8	14 48.62	54 21.36
22	S II U	12 52 35.77 ^a 1414.22	62.50	11 11 54.0 - 8388.4	14 50.89	54 29.70
22	II L	13 16 09.99 ^a 1454.07	63.31	13 31 42.4 7947.1	14 53.67	54 39.90
23	II U	13 40 24.06 ^a 1499.25	64.24	15 44 09.5 7397.7	14 56.89	54 51.71
23	II L	14 05 23.31 ^a 1548.44	65.27	17 47 27.2 6731.1	15 00.49	55 04.90
24	II U	14 31 11.75 ^a 1599.92	66.36	-19 39 38.3 - 5940.2	15 04.39	55 19.22
24	II L	14 57 51.67 ^a 1651.41	67.46	21 18 38.5 - 5021.5	15 08.52	55 34.39
25	II U	15 25 23.08 ^a 1700.27	68.53	22 42 20.0 3976.9	15 12.82	55 50.16
25	II L	15 53 43.35 ^a 1743.62	69.50	23 48 36.9 2815.5	15 17.21	56 06.28
26	I U	16 22 46.97 ^a 1778.65	70.33	24 35 32.4 1554.6	15 21.63	56 22.51
27	I L	16 52 25.62 ^a 1803.00	70.96	-25 01 27.0 - 219.2	15 26.03	56 38.66
27	I U	17 22 28.62 ^a 1815.20	71.36	25 05 06.2 + 1158.8	15 30.35	56 54.53
28	II L	17 52 43.82 ^a 1814.92	71.50	24 45 47.4 + 2543.3	15 34.56	57 09.98
28	I U	18 22 58.74 ^a 1803.03	71.40	24 03 24.1 3897.8	15 38.62	57 24.89
29	II L	18 53 01.77 ^a 1781.50	71.08	22 58 26.3 5189.0	15 42.52	57 39.18
29	I U	19 22 43.27 ^a 1753.06	70.59	-21 31 57.3 + 6388.5	15 46.23	57 52.80
30	II L	19 51 56.33 ^a 1720.76	69.98	19 45 28.8 + 7474.7	15 49.75	58 05.74
30	S I U	20 20 37.09 ^a 1687.65	69.32	17 40 54.1 8432.8	15 53.08	58 17.96
Dec. 1	II L	20 48 44.74 ^a 1656.50	68.66	15 20 21.3 9254.0	15 56.22	58 29.47
1	S I U	21 16 21.24 ^a 1629.54	68.06	12 46 07.3 9933.5	15 59.16	58 40.26
2	II L	21 43 30.78 ^a 1608.62	67.56	-10 00 33.8 + 10469.0	16 01.89	58 50.28
2	S I U	22 10 19.40 ^a 1595.08	67.19	7 06 04.8 + 10859.0	16 04.40	58 59.49
3	II L	22 36 54.48 ^a 1589.76	66.99	4 05 05.8 11101.8	16 06.66	59 07.80
3	S I U	23 03 24.24 ^a 1593.24	66.96	- 1 00 04.0 11194.7	16 08.65	59 15.09
4	II L	23 29 57.48 ^a 1605.62	67.13	+ 2 06 30.7 11133.5	16 10.32	59 21.20
4	S I U	23 56 43.10 ^a 1626.69	67.47	+ 5 12 04.2 + 10911.9	16 11.61	59 25.94
5	II L	0 23 49.79 ^a 1655.80	67.99	8 13 56.1 + 10523.9	16 12.47	59 29.10
5	S I U	0 51 25.59 ^a 1691.71	68.66	11 09 20.0 9962.5	16 12.84	59 30.47
6	II L	1 19 37.30 ^a 1732.64	69.45	13 55 22.5 9223.2	16 12.66	59 29.82
6	S I U	1 48 29.94 ^a 1776.10	70.31	16 29 05.7 8305.7	16 11.88	59 26.94
7	II L	2 18 06.04 ^a 1818.82	71.18	+18 47 31.4 + 7216.3	16 10.44	59 21.68
7	S I U	2 48 24.86 ^a 1857.10	71.99	20 47 47.7 + 5969.5	16 08.33	59 13.93
8	II L	3 19 21.96 ^a 1886.94	72.67	22 27 17.2 4591.4	16 05.53	59 03.65
8	S I U	3 50 48.90 ^a 1904.74	73.14	23 43 48.6 + 3118.2	16 02.06	58 50.89
9	II L	4 22 33.64 ^a	73.34	+24 35 46.8	15 57.94	58 35.80

Dec. 8 U Defective Illumination of N 0°.02

MOON, 1935

AT TRANSIT AT GREENWICH

179

Date	Illuminated Limbs and Transit	Apparent Geocentric Right Ascension of Centre	Sidereal Time of S.D. passing Meridian	Apparent Geocentric Declination of Centre	Geocentric Semi-diameter	Equatorial Horizontal Parallax
Dec. 9	I L	^{h m s} 4 22 33.64	^s 1907.79	^{° ′ ″} +24 35 46.8	^{′ ″} 15 57.94	^{′ ″} 58 35.80
9	N I U	4 54 21.43	1894.81	25 02 22.0 + 1595.2	15 53.26	58 18.61
10	II L	5 25 56.24	1866.32	25 03 34.1 + 72.1	15 48.09	57 59.62
11	N II U	5 57 02.56	1824.39	24 40 11.9 - 1402.2	15 42.53	57 39.22
11	II L	6 27 26.95	1772.17	23 53 47.1 - 2784.8	15 36.70	57 17.83
12	S II U	6 56 59.12	1713.50	+22 46 23.0 - 4044.1	15 30.73	56 55.92
12	II L	7 25 32.62	1652.11	21 20 23.6 - 5159.4	15 24.74	56 33.94
13	S II U	7 53 04.73	1591.23	19 38 21.3 - 6122.3	15 18.86	56 12.35
13	II L	8 19 35.96	1533.56	17 42 47.3 - 6934.0	15 13.20	55 51.59
14	S II U	8 45 09.52	1481.04	15 36 05.5 - 7601.8	15 07.88	55 32.05
14	II L	9 09 50.56	1435.03	+13 20 27.2 - 8138.3	15 02.99	55 14.10
15	S II U	9 33 45.59	1396.37	10 57 50.6 - 8556.6	14 58.62	54 58.04
15	II L	9 57 01.96	1365.57	8 30 00.3 - 8870.3	14 54.83	54 44.16
16	S II U	10 19 47.53	1342.88	5 58 28.6 - 9091.7	14 51.70	54 32.66
16	II L	10 42 10.41	1328.39	3 24 37.4 - 9231.2	14 49.27	54 23.73
17	S II U	11 04 18.80	1322.13	+ 0 49 41.2 - 9296.2	14 47.57	54 17.50
17	II L	11 26 20.93	1324.04	- 1 45 11.2 - 9292.4	14 46.63	54 14.04
18	S II U	11 48 24.97	1334.06	4 18 53.4 - 9222.2	14 46.46	54 13.41
18	II L	12 10 39.03	1352.07	6 50 18.7 - 9085.3	14 47.05	54 15.60
19	S II U	12 33 11.10	1377.89	9 18 18.1 - 8879.4	14 48.41	54 20.56
19	II L	12 56 08.99	1411.16	-11 41 36.8 - 8598.7	14 50.50	54 28.23
20	S II U	13 19 40.15	1451.40	13 58 52.9 - 8236.1	14 53.28	54 38.46
20	II L	13 43 51.55	1497.77	16 08 35.2 - 7782.3	14 56.72	54 51.08
21	S II U	14 08 49.32	1549.05	18 09 01.6 - 7226.4	15 00.75	55 05.87
21	II L	14 34 38.37	1603.58	19 58 19.2 - 6557.6	15 05.30	55 22.58
22	II U	15 01 21.95	1659.06	-21 34 25.7 - 5766.5	15 10.29	55 40.91
22	II L	15 29 01.01	1712.74	22 55 11.6 - 4845.9	15 15.63	56 00.50
23	II U	15 57 33.75	1761.49	23 58 25.9 - 3794.3	15 21.21	56 20.96
23	II L	16 26 55.24	1802.09	24 42 03.1 - 2617.2	15 26.91	56 41.90
24	II U	16 56 57.33	1831.70	25 04 12.0 - 1328.9	15 32.63	57 02.88
24	II L	17 27 29.03	1848.35	-25 03 26.5 + 45.5	15 38.24	57 23.47
25	II U	17 58 17.38	1851.22	24 38 53.7 + 1472.8	15 43.63	57 43.25
26	I L	18 29 08.60	1840.94	23 50 20.6 - 2913.1	15 48.69	58 01.83
26	I U	18 59 49.54	1819.51	22 38 16.7 - 4323.9	15 53.33	58 18.86
27	I L	19 30 09.05	1789.69	21 03 52.7 - 5664.0	15 57.47	58 34.08
27	I U	19 59 58.74	1754.86	-19 08 53.9 + 6898.8	16 01.06	58 47.25
28	I L	20 29 13.60	1718.36	16 55 33.6 + 8000.3	16 04.06	58 58.26
28	I U	20 57 51.96	1683.23	14 26 24.2 - 8949.4	16 06.46	59 07.07
29	I L	21 25 55.19	1651.98	11 44 08.5 - 9735.7	16 08.27	59 13.70
29	S I U	21 53 27.17	1626.54	8 51 34.4 - 10354.1	16 09.50	59 18.22
30	I L	22 20 33.71	1608.32	- 5 51 29.7 + 10804.7	16 10.19	59 20.76
30	S I U	22 47 22.03	1598.23	- 2 46 39.5 + 11090.2	16 10.39	59 21.48
31	I L	23 14 00.26	1596.73	+ 0 20 14.9 - 11214.4	16 10.14	59 20.56
31	S I U	23 40 36.99	1603.93	3 26 35.6 - 11180.7	16 09.48	59 18.16
32	I L	0 07 20.92	1674.1	+ 6 29 47.2 - 10991.6	16 08.47	59 14.44

Dec. 9 U Defective Illumination of II 0°.05
Dec. 9 U Defective Illumination of S 0°.46

Dec. 11 U Defective Illumination of S 0°.10
Dec. 12 U Defective Illumination of N 1°.12

Date	Heliocentric		Logarithm of Radius Vector	Date	Heliocentric		Logarithm of Radius Vector
	Longitude	Latitude			Longitude	Latitude	
Jan. 1	281 18 29.8	-5 39 27.5	9.658 5695	Feb. 16	141 14 02.3	+6 59 21.5	9.532 5637
2	284 13 24.8	5 51 35.6	.656 0898	17	146 21 26.2	6 55 19.2	.539 3378
3	287 10 34.5	6 02 57.4	.653 3433	18	151 19 11.5	6 48 16.3	.546 2241
4	290 10 13.3	6 13 29.8	.650 3293	19	156 07 26.7	6 38 33.2	.553 1601
5	293 12 36.5	6 23 09.2	.647 0469	20	160 46 25.9	6 26 29.8	.560 0908
6	296 18 00.0	-6 31 52.0	9.643 4957	21	165 16 27.0	+6 12 24.8	9.566 9680
7	299 26 40.1	6 39 34.3	.639 6758	22	169 37 51.3	5 56 35.6	.573 7504
8	302 38 53.8	6 46 11.5	.635 5877	23	173 51 02.3	5 39 18.2	.580 4030
9	305 54 58.9	6 51 38.8	.631 2321	24	177 56 25.2	5 20 47.0	.586 8963
10	309 15 13.8	6 55 50.7	.626 6113	25	181 54 25.4	5 01 14.8	.593 2058
11	312 39 57.6	-6 58 41.7	9.621 7283	26	185 45 28.9	+4 40 53.2	9.599 3114
12	316 09 30.3	7 00 05.3	.616 5875	27	189 30 01.4	4 19 52.2	.605 1968
13	319 44 12.1	6 59 54.7	.611 1946	28	193 08 28.3	3 58 20.6	.610 8488
14	323 24 24.4	6 58 02.9	.605 5576	Mar. 1	196 41 14.4	3 36 26.1	.616 2571
15	327 10 29.0	6 54 22.1	.599 6865	2	200 08 43.5	3 14 15.4	.621 4138
16	331 02 48.0	-6 48 44.2	9.593 5941	3	203 31 18.7	+2 51 54.2	9.626 3130
17	335 01 43.8	6 41 00.8	.587 2967	4	206 49 22.2	2 29 27.6	.630 9502
18	339 07 39.1	6 31 03.4	.580 8142	5	210 03 14.9	2 06 59.8	.635 3223
19	343 20 56.1	6 18 43.3	.574 1707	6	213 13 17.3	1 44 34.5	.639 4273
20	347 41 56.4	6 03 51.9	.567 3953	7	216 19 48.7	1 22 14.9	.643 2641
21	352 11 00.8	-5 46 21.3	9.560 5228	8	219 23 07.4	+1 00 03.9	9.646 8321
22	356 48 28.3	5 26 04.5	.553 5943	9	222 23 31.2	0 38 03.7	.650 1312
23	1 34 35.7	5 02 55.5	.546 6572	10	225 21 16.7	+0 16 16.4	.653 1620
24	6 29 36.5	4 36 50.6	.539 7661	11	228 16 40.4	-0 05 16.1	.655 9252
25	11 33 40.3	4 07 48.2	.532 9830	12	231 09 57.5	0 26 32.3	.658 4215
26	16 46 51.8	-3 35 50.2	9.526 3771	13	234 01 23.0	-0 47 30.7	9.660 6519
27	22 09 09.4	3 01 02.4	.520 0245	14	236 51 11.3	1 08 10.0	.662 6175
28	27 40 24.4	2 23 35.0	.514 0070	15	239 39 36.4	1 28 29.0	.664 3193
29	33 20 19.5	1 43 43.8	.508 4101	16	242 26 51.6	1 48 26.7	.665 7581
30	39 08 28.3	1 01 50.1	.503 3218	17	245 13 10.3	2 08 01.9	.666 9347
31	45 04 14.2	-0 18 21.3	9.498 8291	18	247 58 45.1	-2 27 13.7	9.667 8500
Feb. 1	51 06 50.0	+0 26 09.9	.495 0148	19	250 43 48.7	2 46 00.9	.668 5046
2	57 15 17.8	1 11 05.8	.491 9540	20	253 28 33.7	3 04 22.6	.668 8989
3	63 28 29.8	1 55 44.8	.489 7103	21	256 13 12.2	3 22 17.6	.669 0331
4	69 45 09.1	2 39 23.4	.488 3322	22	258 57 56.6	3 39 44.7	.668 9073
5	76 03 51.6	+3 21 17.8	9.487 8504	23	261 42 58.8	-3 56 42.9	9.668 5214
6	82 23 08.7	4 00 46.3	.488 2756	24	264 28 31.3	4 13 10.8	.667 8751
7	88 41 29.3	4 37 11.0	.489 5982	25	267 14 46.3	4 29 06.9	.666 9681
8	94 57 23.2	5 09 59.8	.491 7889	26	270 01 56.3	4 44 29.6	.665 7999
9	101 09 24.3	5 38 47.8	.494 8003	27	272 50 13.8	4 59 17.3	.664 3697
10	107 16 12.7	+6 03 17.9	9.498 5696	28	275 39 51.7	-5 13 28.1	9.662 6765
11	113 16 37.5	6 23 21.0	.503 0223	29	278 31 03.1	5 26 59.9	.660 7194
12	119 09 38.0	6 38 55.4	.508 0759	30	281 24 01.4	5 39 50.5	.658 4975
13	124 54 24.9	6 50 06.1	.513 6436	31	284 19 00.3	5 51 57.4	.656 0097
14	130 30 20.4	6 57 03.7	.519 6375	Apr. 1	287 16 14.3	6 03 17.6	.653 2551
15	135 56 58.2	+7 00 02.9	9.525 9715	2	290 15 57.9	-6 13 48.4	9.650 2329
16	141 14 02.3	+6 59 21.5	9.532 5637	3	293 18 26.4	-6 23 26.1	9.646 9424

MERCURY, 1935

181

Date	Heliocentric		Logarithm of Radius Vector	Date	Heliocentric		Logarithm of Radius Vector
	Longitude	Latitude			Longitude	Latitude	
Apr. 1	287° 16' 14.3	-6° 03' 17.6	9.653 2551	May 17	151° 28' 23.0	+6° 48' 00.6	9.546 4345
2	290 15 57.9	6 13 48.4	.650 2329	18	156 16 21.1	6 38 13.0	.553 3713
3	293 18 26.4	6 23 26.1	.646 9424	19	160 55 03.5	6 26 05.5	.560 3012
4	296 23 55.6	6 32 07.2	.643 3832	20	165 24 48.5	6 11 57.1	.567 1762
5	299 32 42.0	6 39 47.6	.639 5550	21	169 45 57.4	5 56 04.9	.573 9553
6	302 45 02.5	-6 46 22.7	9.635 4586	22	173 58 53.8	+5 38 44.9	9.580 6037
7	306 01 14.8	6 51 47.7	.631 0950	23	178 04 02.7	5 20 11.7	.587 0919
8	309 21 37.6	6 55 57.3	.626 4664	24	182 01 49.8	5 00 37.9	.593 3955
9	312 46 30.0	6 58 45.6	.621 5756	25	185 52 40.9	4 40 14.9	.599 4948
10	316 16 11.7	7 00 06.3	.616 4270	26	189 37 01.9	4 19 12.7	.605 3733
11	319 51 03.3	-6 59 52.8	9.611 0265	27	193 15 18.0	+3 57 40.3	9.611 0181
12	323 31 26.1	6 57 57.8	.605 3821	28	196 47 54.0	3 35 45.3	.616 4190
13	327 17 41.7	6 54 13.5	.599 5041	29	200 15 13.8	3 13 34.1	.621 5682
14	331 10 12.3	6 48 31.9	.593 4053	30	203 37 40.3	2 51 12.7	.626 4595
15	335 09 20.6	6 40 44.6	.587 1019	31	206 55 35.7	2 28 45.9	.631 0887
16	339 15 28.9	-6 30 42.9	9.580 6141	June 1	210 09 21.2	+2 06 18.1	9.635 4527
17	343 28 59.6	6 18 18.2	.573 9659	2	213 19 16.8	1 43 53.0	.639 5497
18	347 50 14.5	6 03 22.1	.567 1869	3	216 25 41.9	1 21 33.7	.643 3783
19	352 19 33.9	5 45 46.5	.560 3120	4	219 28 54.9	0 59 22.9	.646 9380
20	356 57 17.0	5 25 24.5	.553 3825	5	222 29 13.5	0 37 23.1	.650 2291
21	1 43 40.5	-5 02 10.2	9.546 4458	6	225 26 54.5	+0 15 36.2	9.653 2518
22	6 38 57.7	4 35 59.8	.539 5568	7	228 22 13.9	-0 05 55.9	.656 0070
23	11 43 18.2	4 06 52.1	.532 7780	8	231 15 27.3	0 27 11.5	.658 4950
24	16 56 46.4	3 34 48.8	.526 1786	9	234 06 49.5	0 48 09.3	.660 7175
25	22 19 20.7	2 59 55.8	.519 8349	10	236 56 35.1	1 08 48.0	.662 6750
26	27 50 51.8	-2 22 23.7	9.513 8287	11	239 44 57.7	-1 29 06.4	9.664 3688
27	33 31 02.5	1 42 28.5	.508 2459	12	242 32 10.9	1 49 03.4	.665 7997
28	39 19 26.0	1 00 31.5	.503 1743	13	245 18 27.9	2 08 37.9	.666 9684
29	45 15 25.3	-0 17 00.2	.498 7009	14	248 04 01.6	2 27 48.9	.667 8757
30	51 18 12.8	+0 27 32.3	.494 9083	15	250 49 04.4	2 46 35.3	.668 5223
May 1	57 26 50.4	+1 12 28.3	9.491 8715	16	253 33 48.8	-3 04 56.2	9.668 9087
2	63 40 10.0	1 57 06.2	.489 6535	17	256 18 27.2	3 22 50.4	.669 0350
3	69 56 54.5	2 40 42.3	.488 3024	18	259 03 11.8	3 40 16.7	.668 9013
4	76 15 39.7	3 22 32.8	.487 8481	19	261 48 14.7	3 57 13.9	.668 5075
5	82 34 56.5	4 01 56.2	.488 3008	20	264 33 48.2	4 13 40.7	.667 8534
6	88 53 14.1	+4 38 14.7	9.489 6505	21	267 20 04.7	-4 29 35.8	9.666 9385
7	95 09 02.4	5 10 56.5	.491 8672	22	270 07 16.5	4 44 57.4	.665 7622
8	101 20 55.3	5 39 36.9	.494 9028	23	272 55 36.1	4 59 44.0	.664 3238
9	107 27 33.2	6 03 58.9	.498 6941	24	275 45 16.5	5 13 53.7	.662 6225
10	113 27 45.4	6 23 53.7	.503 1664	25	278 36 30.8	5 27 24.3	.660 6574
11	119 20 31.6	+6 39 19.9	9.508 2371	26	281 29 32.5	-5 40 13.5	9.658 4273
12	125 05 02.9	6 50 22.6	.513 8193	27	284 24 35.3	5 52 19.0	.655 9313
13	130 40 41.9	6 57 12.7	.519 8249	28	287 21 53.5	6 03 37.8	.653 1687
14	136 07 02.4	7 00 04.8	.526 1680	29	290 21 41.7	6 14 06.9	.650 1383
15	141 23 48.9	6 59 17.0	.532 7669	30	293 24 15.5	6 23 43.0	.646 8395
16	146 30 55.2	+6 55 08.7	9.539 5456	July 1	296 29 50.3	-6 32 22.3	9.643 2719
17	151 28 23.0	+6 48 00.6	9.546 4345	2	299 38 42.8	-6 40 00.7	9.639 4355

Date	Heliocentric		Logarithm of Radius Vector	Date	Heliocentric		Logarithm of Radius Vector
	Longitude	Latitude			Longitude	Latitude	
July 1	296 29 50.3	-6 32 22.3	9.643 2719	Aug. 16	165 33 14.6	+6 11 28.9	9.567 3846
2	299 38 42.8	6 40 00.7	.639 4355	17	169 54 08.0	5 55 33.7	.574 1605
3	302 51 10.0	6 46 33.7	.635 3308	18	174 06 49.8	5 38 11.3	.580 8045
4	306 07 29.7	6 51 56.5	.630 9590	19	178 11 44.7	5 19 35.9	.587 2878
5	309 28 00.4	6 56 03.7	.626 3222	20	182 09 18.5	5 00 00.3	.593 5857
6	312 53 01.2	-6 58 49.4	9.621 4233	21	185 59 57.3	+4 39 36.0	9.599 6785
7	316 22 51.9	7 00 07.4	.616 2667	22	189 44 06.6	4 18 32.8	.605 5502
8	319 57 53.2	6 59 50.9	.610 8585	23	193 22 11.9	3 56 59.6	.611 1879
9	323 38 26.3	6 57 52.6	.605 2066	24	196 54 37.7	3 35 03.9	.616 5813
10	327 24 53.0	6 54 04.8	.599 3213	25	200 21 47.9	3 12 52.3	.621 7226
11	331 17 35.4	-6 48 19.6	9.593 2158	26	203 44 06.0	+2 50 30.6	9.626 6061
12	335 16 56.1	6 40 28.2	.586 9063	27	207 01 53.3	2 28 03.8	.631 2274
13	339 23 17.7	6 30 22.3	.580 4129	28	210 15 31.2	2 05 36.1	.635 5833
14	343 37 02.3	6 17 53.1	.573 7600	29	213 25 20.0	1 43 11.0	.639 6719
15	347 58 31.5	6 02 52.2	.566 9773	30	216 31 38.9	1 20 51.9	.643 4924
16	352 28 06.1	-5 45 11.7	9.560 0997	31	219 34 46.2	+0 58 41.4	9.647 0440
17	357 06 05.0	5 24 44.5	.553 1686	Sept. 1	222 34 59.6	0 36 42.0	.650 3268
18	1 52 44.6	5 01 24.8	.546 2322	2	225 32 35.9	+0 14 55.5	.653 3414
19	6 48 18.5	4 35 09.0	.539 3452	3	228 27 51.1	-0 06 36.0	.656 0882
20	11 52 55.8	4 05 55.9	.532 5704	4	231 21 00.8	0 27 51.1	.658 5683
21	17 06 41.0	-3 33 47.2	9.525 9774	5	234 12 19.8	-0 48 48.2	9.660 7825
22	22 29 32.1	2 58 49.2	.519 6424	6	237 02 02.5	1 09 26.4	.662 7320
23	28 01 19.7	2 21 12.5	.513 6474	7	239 50 22.8	1 29 44.1	.664 4176
24	33 41 46.2	1 41 13.1	.508 0785	8	242 37 34.0	1 49 40.4	.665 8403
25	39 30 24.6	0 59 12.7	.503 0235	9	245 23 49.4	2 09 14.2	.667 0010
26	45 26 37.5	-0 15 39.0	9.498 5693	10	248 09 21.8	-2 28 24.5	9.667 9003
27	51 29 37.1	+0 28 54.9	.494 7984	11	250 54 23.8	2 47 10.1	.668 5390
28	57 38 25.0	1 13 51.1	.491 7855	12	253 39 07.8	3 05 30.1	.668 9174
29	63 51 52.6	1 58 27.8	.489 5934	13	256 23 46.1	3 23 23.4	.669 0356
30	70 08 42.6	2 42 01.3	.488 2693	14	259 08 31.1	3 40 48.8	.668 8938
31	76 27 30.6	+3 23 48.0	9.487 8426	15	261 53 34.7	-3 57 45.2	9.668 4918
Aug. 1	82 46 47.5	4 03 06.3	.488 3230	16	264 39 09.3	4 14 11.0	.667 8297
2	89 05 02.4	4 39 18.5	.489 6999	17	267 25 27.2	4 30 05.1	.666 9067
3	95 20 45.2	5 11 53.3	.491 9426	18	270 12 40.9	4 45 25.7	.665 7223
4	101 32 30.1	5 40 25.9	.495 0026	19	273 01 02.8	5 00 11.1	.664 2758
5	107 38 57.7	+6 04 39.9	9.498 8163	20	275 50 45.8	-5 14 19.6	9.662 5663
6	113 38 57.5	6 24 26.5	.503 3087	21	278 42 03.2	5 27 48.9	.660 5928
7	119 31 29.6	6 39 44.3	.508 3966	22	281 35 08.4	5 40 36.8	.658 3546
8	125 15 45.4	6 50 39.0	.513 9934	23	284 30 15.1	5 52 40.9	.655 8505
9	130 51 07.9	6 57 21.4	.520 0111	24	287 27 37.7	6 03 58.2	.653 0795
10	136 17 11.2	+7 00 06.6	9.526 3637	25	290 27 30.8	-6 14 25.7	9.650 0407
11	141 33 40.2	6 59 12.2	.532 9697	26	293 30 09.8	6 24 00.1	.646 7334
12	146 40 28.8	6 54 58.1	.539 7531	27	296 35 50.6	6 32 37.5	.643 1574
13	151 37 39.1	6 47 44.7	.546 6447	28	299 44 49.4	6 40 13.9	.639 3125
14	156 25 20.0	6 37 52.3	.553 5824	29	302 57 23.6	6 46 44.9	.635 1994
15	161 03 45.7	+6 25 40.8	9.560 5116	30	306 13 50.7	-6 52 05.4	9.630 8192
16	165 33 14.6	+6 11 28.9	9.567 3846	Oct. 1	309 34 29.3	-6 56 10.1	9.626 1740

Date	Heliocentric		Logarithm of Radius Vector	Date	Heliocentric		Logarithm of Radius Vector
	Longitude	Latitude			Longitude	Latitude	
Oct. 1	309 34 29.3	-6 56 10.1	9.626 1740	Nov. 16	182 16 48.1	+4 59 22.7	9.593 7797
2	312 59 38.8	6 58 53.2	.621 2670	17	186 07 14.3	4 38 56.9	.599 8658
3	316 29 38.9	7 00 08.4	.616 1024	18	189 51 11.8	4 17 52.7	.605 7304
4	320 04 50.2	6 59 48.8	.610 6863	19	193 29 06.1	3 56 18.7	.611 3606
5	323 45 34.0	6 57 47.2	.605 0270	20	197 01 21.7	3 34 22.4	.616 7463
6	327 32 12.0	-6 53 55.9	9.599 1345	21	200 28 22.5	+3 12 10.4	9.621 8797
7	331 25 06.5	6 48 06.8	.593 0223	22	203 50 31.5	2 49 48.5	.626 7550
8	335 24 39.9	6 40 11.5	.586 7066	23	207 08 10.7	2 27 21.6	.631 3681
9	339 31 14.9	6 30 01.2	.580 2076	24	210 21 41.2	2 04 53.9	.635 7158
10	343 45 13.7	6 17 27.4	.573 5500	25	213 31 23.1	1 42 29.0	.639 7960
11	348 06 57.8	-6 02 21.6	9.566 7635	26	216 37 35.7	+1 20 10.1	9.643 6080
12	352 36 47.9	5 44 36.0	.559 8834	27	219 40 37.3	0 58 00.0	.647 1514
13	357 15 02.8	5 24 03.5	.552 9513	28	222 40 45.5	0 36 00.9	.650 4258
14	2 01 58.9	5 00 38.5	.546 0152	29	225 38 17.1	+0 14 14.9	.653 4318
15	6 57 49.7	4 34 17.1	.539 1306	30	228 33 28.2	-0 07 16.2	.656 1703
16	12 02 44.2	-4 04 58.4	9.532 3603	Dec. 1	231 26 34.2	-0 28 30.7	9.658 6420
17	17 16 46.6	3 32 44.4	.525 7738	2	234 17 50.0	0 49 27.4	.660 8479
18	22 39 54.7	2 57 41.2	.519 4480	3	237 07 29.8	1 10 04.8	.662 7891
19	28 11 58.9	2 19 59.7	.513 4648	4	239 55 47.7	1 30 21.9	.664 4664
20	33 52 41.5	1 39 56.2	.507 9106	5	242 42 57.0	1 50 17.5	.665 8809
21	39 41 34.8	-0 57 52.4	9.502 8731	6	245 29 10.8	-2 09 50.5	9.667 0335
22	45 38 01.4	-0 14 16.3	.498 4389	7	248 14 42.1	2 29 00.0	.667 9247
23	51 41 13.0	+0 30 19.0	.494 6907	8	250 59 43.3	2 47 44.9	.668 5552
24	57 50 10.9	1 15 15.2	.491 7025	9	253 44 27.0	3 06 04.1	.668 9255
25	64 03 46.2	1 59 50.6	.489 5366	10	256 29 05.4	3 23 56.6	.669 0355
26	70 20 41.3	+2 43 21.4	9.488 2402	11	259 13 50.7	-3 41 21.1	9.668 8856
27	76 39 31.8	3 25 04.2	.487 8419	12	261 58 55.2	3 58 16.5	.668 4757
28	82 58 48.4	4 04 17.2	.488 3508	13	264 44 30.9	4 14 41.4	.667 8055
29	89 17 00.0	4 40 23.2	.489 7555	14	267 30 50.3	4 30 34.4	.666 8744
30	95 32 36.9	5 12 50.7	.492 0246	15	270 18 05.9	4 45 53.9	.665 6818
31	101 44 13.1	+5 41 15.4	9.495 1092	16	273 06 30.1	-5 00 38.2	9.664 2271
Nov. 1	107 50 29.7	6 05 21.1	.498 9455	17	275 56 15.9	5 14 45.5	.662 5094
2	113 50 16.5	6 24 59.2	.503 4579	18	278 47 36.4	5 28 13.6	.660 5279
3	119 42 33.9	6 40 08.8	.508 5633	19	281 40 45.2	5 41 00.2	.658 2814
4	125 26 33.6	6 50 55.4	.514 1746	20	284 35 55.9	5 53 02.8	.655 7690
5	131 01 38.9	+6 57 30.1	9.520 2042	21	287 33 22.9	-6 04 18.6	9.652 9896
6	136 27 24.6	7 00 08.0	.526 5662	22	290 33 21.0	6 14 44.5	.649 9425
7	141 43 35.5	6 59 07.1	.533 1791	23	293 36 05.4	6 24 17.1	.646 6269
8	146 50 05.9	6 54 47.1	.539 9672	24	296 41 52.0	6 32 52.7	.643 0424
9	151 46 58.3	6 47 28.4	.546 8612	25	299 50 57.3	6 40 27.2	.639 1893
10	156 34 21.6	+6 37 31.5	9.553 7994	26	303 03 38.4	-6 46 56.0	9.635 0680
11	161 12 30.2	6 25 15.9	.560 7275	27	306 20 13.1	6 52 14.2	.630 6797
12	165 41 42.5	6 11 00.5	.567 5981	28	309 40 59.9	6 56 16.5	.626 0265
13	170 02 20.2	5 55 02.3	.574 3704	29	313 06 18.0	6 58 56.9	.621 1113
14	174 14 47.0	5 37 37.4	.581 0100	30	316 36 27.4	7 00 09.2	.615 9388
15	178 19 27.7	+5 19 00.0	9.587 4878	31	320 11 48.7	-6 59 46.6	9.610 5152
16	182 16 48.1	+4 59 22.7	9.593 7797	32	323 52 43.1	-6 57 41.7	9.604 8486

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	True Dist- ance from the Earth	Meri- dian Passage
Jan. 1	^h 18 ^m 44 ^s 49.22 +426.04	[°] -24 ['] 50 ["] 41.4 + 278.3	2.32	6.12	1.437 242	^h 12 ^m 07.6
2	18 51 55.26 +426.83	24 46 03.1 + 367.7	2.33	6.14	.434 075	12 10.7
3	18 59 02.09 +427.47	24 39 55.4 + 457.9	2.34	6.15	.430 305	12 13.9
4	19 06 09.56 +427.96	24 32 17.5 + 549.1	2.34	6.17	.425 920	12 17.1
5	19 13 17.52 +428.29	24 23 08.4 + 641.1	2.35	6.19	.420 907	12 20.3
6	19 20 25.81 +428.44	-24 12 27.3 + 733.7	2.36	6.22	1.415 252	12 23.5
7	19 27 34.25 +428.38	24 00 13.6 + 827.0	2.37	6.25	.408 939	12 26.7
8	19 34 42.63 +428.13	23 46 26.6 + 920.7	2.39	6.28	.401 952	12 29.9
9	19 41 50.76 +427.63	23 31 05.9 + 1014.9	2.40	6.31	.394 271	12 33.1
10	19 48 58.39 +426.91	23 14 11.0 + 1109.2	2.41	6.35	.385 879	12 36.3
11	19 56 05.30 +425.92	-22 55 41.8 + 1203.6	2.43	6.39	1.376 753	12 39.5
12	20 03 11.22 +424.60	22 35 38.2 + 1297.8	2.44	6.44	.366 872	12 42.6
13	20 10 15.82 +422.98	22 14 00.4 + 1391.6	2.46	6.49	.356 212	12 45.7
14	20 17 18.80 +420.97	21 50 48.8 + 1484.7	2.48	6.54	.344 748	12 48.8
15	20 24 19.77 +418.57	21 26 04.1 + 1576.8	2.51	6.60	.332 455	12 51.9
16	20 31 18.34 +415.67	-20 59 47.3 + 1667.4	2.53	6.67	1.319 307	12 54.9
17	20 38 14.01 +412.28	20 31 59.9 + 1756.0	2.56	6.74	.305 276	12 57.9
18	20 45 06.29 +408.26	20 02 43.9 + 1842.1	2.59	6.82	.290 337	13 00.8
19	20 51 54.55 +403.56	19 32 01.8 + 1925.2	2.62	6.90	.274 465	13 03.6
20	20 58 38.11 +398.10	18 59 56.6 + 2004.2	2.66	7.00	.257 636	13 06.4
21	21 05 16.21 +391.74	-18 26 32.4 + 2078.2	2.70	7.10	1.239 829	13 09.0
22	21 11 47.95 +384.36	17 51 54.2 + 2146.5	2.74	7.21	.221 028	13 11.5
23	21 18 12.31 +375.84	17 16 07.7 + 2207.4	2.78	7.32	.201 221	13 13.9
24	21 24 28.15 +366.01	16 39 20.3 + 2260.0	2.83	7.45	.180 404	13 16.1
25	21 30 34.16 +354.71	16 01 40.3 + 2302.2	2.88	7.59	.158 582	13 18.2
26	21 36 28.87 +341.76	-15 23 18.1 + 2332.8	2.94	7.75	1.135 772	13 20.1
27	21 42 10.63 +326.93	14 44 25.3 + 2349.8	3.00	7.91	.112 005	13 21.7
28	21 47 37.56 +310.12	14 05 15.5 + 2351.0	3.07	8.09	.087 327	13 23.0
29	21 52 47.68 +291.04	13 26 04.5 + 2334.4	3.15	8.29	.061 804	13 24.1
30	21 57 38.72 +269.57	12 47 10.1 + 2298.2	3.23	8.50	.035 525	13 24.8
31	22 02 08.29 +245.58	-12 08 51.9 + 2240.0	3.31	8.72	1.008 600	13 25.1
Feb. 1	22 06 13.87 +218.94	11 31 31.9 + 2158.3	3.41	8.97	.0981 165	13 25.0
2	22 09 52.81 +189.62	10 55 33.6 + 2051.3	3.51	9.23	.953 382	13 24.5
3	22 13 02.43 +157.70	10 21 22.3 + 1918.2	3.61	9.51	.925 436	13 23.4
4	22 15 40.13 +123.27	9 49 24.1 + 1758.2	3.72	9.80	.897 538	13 21.8
5	22 17 43.40 +86.65	-9 20 05.9 + 1571.8	3.84	10.12	.0869 916	13 19.6
6	22 19 10.05 +48.22	8 53 54.1 + 1360.2	3.96	10.44	.842 817	13 16.7
7	22 19 58.27 +8.54	8 31 13.9 + 1125.1	4.09	10.78	.816 496	13 13.2
8	22 20 06.81 +31.67	8 12 28.8 + 870.6	4.22	11.12	.791 213	13 09.1
9	22 19 35.14 +71.59	7 57 58.2 + 600.7	4.36	11.47	.767 223	13 04.3
10	22 18 23.55 +110.19	-7 47 57.5 + 321.1	4.49	11.82	.0744 773	12 58.8
11	22 16 33.36 +146.47	7 42 36.4 + 38.4	4.61	12.15	.724 090	12 52.7
12	22 14 06.89 +179.30	7 41 58.0 + 239.6	4.73	12.48	.705 375	12 46.0
13	22 11 07.59 +207.64	7 45 57.6 + 505.6	4.85	12.78	.688 798	12 38.9
14	22 07 39.95 +230.56	7 54 23.2 + 751.3	4.95	13.05	.674 491	12 31.3
15	22 03 49.39 +247.35	-8 06 54.5 + 970.4	5.04	13.28	.0662 545	12 23.4
16	21 59 42.04 +247.35	-8 23 04.9 + 970.4	5.12	13.48	.0653 006	12 15.3

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	True Dist- ance from the Earth	Meri- dian Passage
Feb. 16	^{h m s} 21 59 42.04	^{° ' "} - 8 23 04.9	["] 5.12	["] 13.48	["] 0.653 006	^{h m s} 12 15.3
17	21 55 24.51	8 42 21.4	5.17	13.62	.645 877	12 07.1
18	21 51 03.55	9 04 07.6	5.21	13.73	.641 119	11 58.8
19	21 46 45.73	9 27 44.7	5.23	13.78	.638 654	11 50.7
20	21 42 37.21	9 52 34.2	5.23	13.78	.638 372	11 42.8
21	21 38 43.43	-10 17 59.4	5.22	13.75	0.640 136	11 35.1
22	21 35 08.97	10 43 26.3	5.19	13.67	.643 791	11 27.8
23	21 31 57.50	11 08 25.8	5.15	13.56	.649 170	11 20.9
24	21 29 11.71	11 32 33.0	5.09	13.41	.656 101	11 14.5
25	21 26 53.42	11 55 27.7	5.03	13.24	.664 411	11 08.5
26	21 25 03.62	-12 16 54.1	4.96	13.06	0.673 934	11 02.9
27	21 23 42.65	12 36 40.7	4.88	12.86	.684 511	10 57.9
28	21 22 50.28	12 54 38.9	4.80	12.64	.695 995	10 53.3
Mar. 1	21 22 25.83	13 10 43.3	4.72	12.42	.708 249	10 49.1
2	21 22 28.32	13 24 50.5	4.63	12.20	.721 150	10 45.4
3	21 22 56.51	-13 36 59.0	4.55	11.98	0.734 589	10 42.2
4	21 23 49.05	13 47 08.3	4.47	11.76	.748 466	10 39.3
5	21 25 04.51	13 55 19.2	4.38	11.54	.762 695	10 36.8
6	21 26 41.41	14 01 33.1	4.30	11.32	.777 200	10 34.6
7	21 28 38.31	14 05 51.7	4.22	11.11	.791 916	10 32.7
8	21 30 53.80	-14 08 17.2	4.14	10.91	0.806 784	10 31.2
9	21 33 26.54	14 08 51.6	4.07	10.71	.821 756	10 29.9
10	21 36 15.23	14 07 37.4	3.99	10.52	.836 788	10 28.9
11	21 39 18.66	14 04 36.9	3.92	10.33	.851 846	10 28.1
12	21 42 35.74	13 59 52.4	3.85	10.15	.866 898	10 27.5
13	21 46 05.42	-13 53 26.0	3.79	9.98	0.881 917	10 27.2
14	21 49 46.74	13 45 20.0	3.73	9.81	.896 881	10 27.0
15	21 53 38.81	13 35 36.3	3.66	9.65	.911 770	10 27.0
16	21 57 40.83	13 24 17.1	3.60	9.50	.926 569	10 27.2
17	22 01 52.07	13 11 24.1	3.55	9.35	.941 265	10 27.5
18	22 06 11.86	-12 56 59.4	3.49	9.21	0.955 846	10 27.9
19	22 10 39.57	12 41 04.5	3.44	9.07	.970 301	10 28.5
20	22 15 14.69	12 23 41.1	3.40	8.94	.984 624	10 29.2
21	22 19 56.69	12 04 50.7	3.35	8.81	0.998 807	10 30.0
22	22 24 45.15	11 44 34.9	3.30	8.69	1.012 844	10 30.9
23	22 29 39.66	-11 22 55.2	3.25	8.57	1.026 730	10 31.9
24	22 34 39.88	10 59 52.8	3.21	8.46	.040 460	10 33.0
25	22 39 45.50	10 35 29.3	3.17	8.35	.054 030	10 34.2
26	22 44 56.24	10 09 45.8	3.13	8.24	.067 434	10 35.5
27	22 50 11.88	9 42 43.7	3.09	8.14	.080 670	10 36.8
28	22 55 32.20	- 9 14 24.0	3.05	8.04	1.093 733	10 38.2
29	23 00 57.06	8 44 48.0	3.02	7.95	.106 618	10 39.7
30	23 06 26.30	8 13 57.0	2.99	7.86	.119 319	10 41.3
31	23 11 59.83	7 41 52.1	2.95	7.77	.131 831	10 43.0
Apr. 1	23 17 37.55	7 08 34.3	2.92	7.69	.144 147	10 44.7
2	23 23 19.42	- 6 34 04.9	2.89	7.61	1.156 260	10 46.5
3	23 29 05.39	5 58 25.1	2.86	7.53	1.168 162	10 48.3

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	True Dist- ance from the Earth	Meri- dian Passage
Apr. 1	^h 23 ^m 17 ^s 37.55 +341.87	[°] - 7 ['] 08 ["] 34.3 -2069.4	2.92	7.69	I.144 147	^h 10 ^m 44.7
2	23 23 19.42 +345.97	6 34 04.9 +2139.8	2.89	7.61	.156 260	10 46.5
3	23 29 05.39 350.09	5 58 25.1 2209.3	2.86	7.53	.168 162	10 48.3
4	23 34 55.48 354.24	5 21 35.8 2277.4	2.83	7.46	.179 843	10 50.3
5	23 40 49.72 358.40	4 43 38.4 2344.4	2.81	7.39	.191 291	10 52.3
6	23 46 48.12 +362.64	- 4 04 34.0 +2410.2	2.78	7.32	I.202 494	10 54.3
7	23 52 50.76 366.97	3 24 23.8 2474.6	2.75	7.25	.213 436	10 56.5
8	23 58 57.73 371.42	2 43 09.2 2537.8	2.73	7.19	.224 103	10 58.7
9	0 05 09.15 375.98	2 00 51.4 2599.5	2.71	7.13	.234 475	11 01.0
10	0 11 25.13 380.70	1 17 31.9 2659.5	2.69	7.07	.244 529	11 03.3
11	0 17 45.83 +385.57	- 0 33 12.4 +2718.0	2.67	7.02	I.254 241	11 05.8
12	0 24 11.40 390.63	+ 0 12 05.6 2774.4	2.64	6.96	.263 583	11 08.3
13	0 30 42.03 395.86	0 58 20.0 2828.9	2.62	6.91	.272 525	11 10.9
14	0 37 17.89 401.31	1 45 28.9 2880.8	2.61	6.87	.281 030	11 13.6
15	0 43 59.20 406.96	2 33 29.7 2930.2	2.59	6.83	.289 061	11 16.4
16	0 50 46.16 +412.80	+ 3 22 19.9 +2976.6	2.58	6.79	I.296 573	11 19.3
17	0 57 38.96 418.88	4 11 56.5 3019.3	2.56	6.75	.303 520	11 22.3
18	1 04 37.84 425.11	5 02 15.8 3058.4	2.55	6.72	.309 850	11 25.4
19	1 11 42.95 431.55	5 53 14.2 3092.7	2.54	6.69	.315 505	11 28.6
20	1 18 54.50 438.14	6 44 46.9 3122.2	2.53	6.66	.320 427	11 31.9
21	1 26 12.64 +444.85	+ 7 36 49.1 +3145.7	2.52	6.64	I.324 550	11 35.3
22	1 33 37.49 451.63	8 29 14.8 3162.7	2.52	6.63	.327 804	11 38.8
23	1 41 09.12 458.41	9 21 57.5 3172.8	2.51	6.62	.330 120	11 42.5
24	1 48 47.53 465.17	10 14 50.3 3174.1	2.51	6.61	.331 425	11 46.3
25	1 56 32.70 471.75	11 07 44.4 3166.8	2.51	6.61	.331 646	11 50.1
26	2 04 24.45 +478.13	+12 00 31.2 +3149.1	2.51	6.61	I.330 710	11 54.1
27	2 12 22.58 484.12	12 53 00.3 3121.0	2.51	6.62	.328 551	11 58.2
28	2 20 26.70 489.64	13 45 01.3 3081.3	2.52	6.64	.325 107	12 02.4
29	2 28 36.34 494.57	14 36 22.6 3029.7	2.53	6.66	.320 325	12 06.7
30	2 36 50.91 498.76	15 26 52.3 2965.4	2.54	6.70	.314 164	12 11.0
May 1	2 45 09.67 +502.09	+16 16 17.7 +2889.0	2.56	6.73	I.306 595	12 15.4
2	2 53 31.76 504.45	17 04 26.7 2799.8	2.58	6.78	.297 610	12 19.9
3	3 01 56.21 505.71	17 51 06.5 2698.8	2.60	6.84	.287 214	12 24.4
4	3 10 21.92 505.82	18 36 05.3 2586.6	2.62	6.90	.275 434	12 28.9
5	3 18 47.74 504.72	19 19 11.9 2464.2	2.65	6.97	.262 315	12 33.4
6	3 27 12.46 +502.35	+20 00 16.1 +2332.9	2.68	7.05	I.247 920	12 37.9
7	3 35 34.81 498.75	20 39 09.0 2194.2	2.71	7.14	.232 330	12 42.3
8	3 43 53.56 493.91	21 15 43.2 2049.5	2.75	7.24	.215 636	12 46.6
9	3 52 07.47 487.87	21 49 52.7 1900.4	2.79	7.34	.197 943	12 50.9
10	4 00 15.34 480.69	22 21 33.1 1748.7	2.83	7.46	.179 362	12 55.0
11	4 08 16.03 +472.47	+22 50 41.8 +1595.5	2.88	7.59	I.160 008	12 59.0
12	4 16 08.50 463.24	23 17 17.3 1442.7	2.93	7.72	.139 998	13 02.9
13	4 23 51.74 453.11	23 41 20.0 1290.9	2.99	7.86	.119 445	13 06.6
14	4 31 24.85 442.15	24 02 50.9 1141.5	3.04	8.01	.098 460	13 10.1
15	4 38 47.00 430.42	24 21 52.4 995.4	3.10	8.17	.077 149	13 13.4
16	4 45 57.42 +418.00	+24 38 27.8 + 853.1	3.16	8.33	I.055 610	13 16.5
17	4 52 55.42	+24 52 40.9	3.23	8.51	I.033 933	13 19.4

Date	Apparent Right Ascension			Apparent Declination			Semi- diam- eter	Hor. Par.	True Dist- ance from the Earth	Meri- dian Passage
	^h	^m	^s	[°]	[']	["]				^h ^m
May 17	4	52	55.42	+24	52	40.9	3.23	8.51	1.033 933	13 19.4
18	4	59	40.33	+25	04	36.2	3.30	8.69	1.012 204	13 22.1
19	5	06	11.61	25	14	18.7	3.37	8.88	0.990 496	13 24.6
20	5	12	28.69	25	21	53.6	3.45	9.08	.968 879	13 26.8
21	5	18	31.09	25	27	26.4	3.53	9.29	.947 414	13 28.8
22	5	24	18.31	+25	31	02.5	3.61	9.50	0.926 157	13 30.5
23	5	29	49.93	25	32	47.7	3.69	9.72	.905 158	13 31.9
24	5	35	05.48	25	32	47.9	3.78	9.95	.884 460	13 33.1
25	5	40	04.56	25	31	08.2	3.87	10.18	.864 105	13 33.9
26	5	44	46.74	25	27	54.8	3.96	10.42	.844 129	13 34.5
27	5	49	11.63	+25	23	12.9	4.05	10.67	0.824 566	13 34.8
28	5	53	18.82	25	17	08.2	4.15	10.93	.805 447	13 34.9
29	5	57	07.94	25	09	45.8	4.25	11.18	.786 802	13 34.6
30	6	00	38.59	25	01	11.1	4.35	11.45	.768 658	13 33.9
31	6	03	50.40	24	51	29.4	4.45	11.72	.751 043	13 33.0
June 1	6	06	43.03	+24	40	45.7	4.55	11.99	0.733 984	13 31.8
2	6	09	16.15	24	29	05.1	4.66	12.26	.717 506	13 30.2
3	6	11	29.48	24	16	32.3	4.76	12.54	.701 638	13 28.3
4	6	13	22.74	24	03	12.8	4.87	12.82	.686 408	13 26.1
5	6	14	55.79	23	49	11.1	4.97	13.10	.671 843	13 23.5
6	6	16	08.48	+23	34	32.0	5.08	13.37	0.657 971	13 20.6
7	6	17	00.81	23	19	20.4	5.18	13.65	.644 824	13 17.3
8	6	17	32.84	23	03	41.5	5.28	13.91	.632 433	13 13.7
9	6	17	44.81	22	47	40.3	5.38	14.17	.620 829	13 09.8
10	6	17	37.06	22	31	21.8	5.47	14.42	.610 045	13 05.6
11	6	17	10.12	+22	14	51.2	5.57	14.66	0.600 114	13 01.0
12	6	16	24.68	21	58	14.5	5.65	14.89	.591 070	12 56.2
13	6	15	21.66	21	41	37.1	5.73	15.10	.582 946	12 51.1
14	6	14	02.18	21	25	05.4	5.80	15.28	.575 776	12 45.7
15	6	12	27.56	21	08	45.3	5.87	15.45	.569 590	12 40.1
16	6	10	39.39	+20	52	43.6	5.92	15.59	0.564 420	12 34.2
17	6	08	39.41	20	37	07.2	5.96	15.71	.560 294	12 28.2
18	6	06	29.61	20	22	03.1	5.99	15.79	.557 237	12 22.1
19	6	04	12.12	20	07	38.8	6.02	15.85	.555 271	12 15.8
20	6	01	49.23	19	54	01.1	6.03	15.87	.554 416	12 09.5
21	5	59	23.30	+19	41	17.3	6.02	15.86	0.554 684	12 03.1
22	5	56	56.79	19	29	34.6	6.00	15.82	.556 087	11 56.8
23	5	54	32.13	19	18	59.3	5.98	15.75	.558 629	11 50.5
24	5	52	11.76	19	09	37.5	5.94	15.65	.562 311	11 44.3
25	5	49	58.00	19	01	34.4	5.89	15.52	.567 128	11 38.2
26	5	47	53.06	+18	54	54.9	5.83	15.36	0.573 074	11 32.3
27	5	45	59.01	18	49	42.1	5.76	15.17	.580 135	11 26.6
28	5	44	17.72	18	45	58.9	5.68	14.96	.588 295	11 21.1
29	5	42	50.92	18	43	46.7	5.59	14.73	.597 537	11 15.8
30	5	41	40.07	18	43	05.9	5.50	14.48	.607 837	11 10.8
July 1	5	40	46.48	+18	43	55.8	5.40	14.21	0.619 173	11 06.1
2	5	40	11.24	+18	46	14.5	5.29	13.93	0.631 519	11 01.8

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	True Dist- ance from the Earth	Meri- dian Passage
July	^h ^m ^s	[°] ['] ^{''}	^{''}	['] ^{''}		^h ^m
1	5 40 46.48 - 35.24	+18 43 55.8 + 138.7	5.40	14.21	0.619 173	11 06.1
2	5 40 11.24 - 15.97	18 46 14.5 + 225.1	5.29	13.93	.631 519	11 01.8
3	5 39 55.27 + 4.04	18 49 59.6 307.6	5.18	13.65	.644 847	10 57.7
4	5 39 59.31 24.60	18 55 07.2 385.6	5.07	13.35	.659 128	10 54.0
5	5 40 23.91 45.67	19 01 32.8 458.4	4.95	13.05	.674 333	10 50.7
6	5 41 09.58 + 67.03	+19 09 11.2 + 525.1	4.84	12.75	0.690 431	10 47.7
7	5 42 16.61 88.66	19 17 56.3 + 585.2	4.72	12.44	.707 389	10 45.0
8	5 43 45.27 110.42	19 27 41.5 638.3	4.61	12.13	.725 176	10 42.7
9	5 45 35.69 132.27	19 38 19.8 683.3	4.49	11.83	.743 756	10 40.8
10	5 47 47.96 154.15	19 49 43.1 720.3	4.38	11.53	.763 094	10 39.2
11	5 50 22.11 +176.06	+20 01 43.4 + 748.7	4.27	11.24	0.783 152	10 38.0
12	5 53 18.17 197.88	20 14 12.1 + 767.8	4.16	10.95	.803 888	10 37.1
13	5 56 36.05 219.62	20 26 59.9 777.6	4.05	10.66	.825 258	10 36.6
14	6 00 15.67 241.27	20 39 57.5 777.4	3.95	10.39	.847 216	10 36.5
15	6 04 16.94 262.75	20 52 54.9 766.9	3.84	10.12	.869 709	10 36.8
16	6 08 39.69 +284.06	+21 05 41.8 + 745.7	3.74	9.86	0.892 680	10 37.4
17	6 13 23.75 305.13	21 18 07.5 + 713.5	3.65	9.61	.916 064	10 38.3
18	6 18 28.88 325.91	21 30 01.0 660.7	3.55	9.36	.939 792	10 39.6
19	6 23 54.79 346.30	21 41 10.7 614.5	3.46	9.13	.963 785	10 41.2
20	6 29 41.09 366.23	21 51 25.2 547.2	3.38	8.91	0.987 956	10 43.2
21	6 35 47.32 +385.62	+22 00 32.4 + 468.1	3.30	8.69	1.012 212	10 45.5
22	6 42 12.94 404.28	22 08 20.5 377.0	3.22	8.49	.036 449	10 48.2
23	6 48 57.22 422.13	22 14 37.5 274.1	3.15	8.30	.060 555	10 51.1
24	6 55 59.35 438.97	22 19 11.6 160.2	3.08	8.11	.084 412	10 54.3
25	7 03 18.32 454.67	22 21 51.8 + 35.3	3.02	7.94	.107 896	10 57.8
26	7 10 52.99 +469.06	+22 22 27.1 - 99.0	2.95	7.78	1.130 878	11 01.6
27	7 18 42.05 481.94	22 20 48.1 241.9	2.89	7.63	.153 227	11 05.6
28	7 26 43.99 493.24	22 16 46.2 391.9	2.84	7.49	.174 814	11 09.8
29	7 34 57.23 502.77	22 10 14.3 547.0	2.80	7.36	.195 515	11 14.1
30	7 43 20.00 510.49	22 01 07.3 705.8	2.75	7.24	.215 213	11 18.6
31	7 51 50.49 +516.31	+21 49 21.5 - 866.0	2.71	7.13	1.233 804	11 23.3
Aug. 1	8 00 26.80 520.26	21 34 55.5 1025.6	2.67	7.03	.251 197	11 28.0
2	8 09 07.06 522.38	21 17 49.9 1183.0	2.64	6.94	.267 321	11 32.8
3	8 17 49.44 522.76	20 58 06.9 1335.9	2.61	6.86	.282 119	11 37.6
4	8 26 32.20 521.48	20 35 51.0 1483.3	2.58	6.79	.295 556	11 42.3
5	8 35 13.68 +518.73	+20 11 07.7 - 1623.3	2.56	6.73	1.307 617	11 47.1
6	8 43 52.41 514.67	19 44 04.4 1755.6	2.53	6.67	.318 302	11 51.8
7	8 52 27.08 509.47	19 14 48.8 1878.7	2.51	6.63	.327 628	11 56.4
8	9 00 56.55 503.34	18 43 30.1 1992.5	2.50	6.59	.335 627	12 00.9
9	9 09 19.89 496.42	18 10 17.6 2096.8	2.49	6.56	.342 340	12 05.3
10	9 17 36.31 +488.94	+17 35 20.8 - 2191.7	2.48	6.53	1.347 818	12 09.6
11	9 25 45.25 480.96	16 58 49.1 2276.9	2.47	6.51	.352 118	12 13.7
12	9 33 46.21 472.71	16 20 52.2 2353.3	2.47	6.49	.355 301	12 17.7
13	9 41 38.92 464.27	15 41 38.9 2421.1	2.46	6.48	.357 429	12 21.6
14	9 49 23.19 455.71	15 01 17.8 2480.5	2.46	6.48	.358 566	12 25.3
15	9 56 58.90 +447.19	+14 19 57.3 - 2532.1	2.46	6.48	1.358 772	12 28.9
16	10 04 26.09	+13 37 45.2	2.46	6.48	1.358 109	12 32.4

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	True Dist- ance from the Earth	Meri- dian Passage
	^h ^m ^s	[°] ['] ["]	["]	["]		^h ^m
Aug. 16	10 04 26.09 +438.71	+13 37 45.2 -2576.7	2.46	6.48	1.358 109	12 32.4
17	10 11 44.80 +430.36	12 54 48.5 2614.5	2.47	6.49	.356 633	12 35.7
18	10 18 55.16 422.18	12 11 14.0 2646.5	2.47	6.50	.354 398	12 38.8
19	10 25 57.34 414.20	11 27 07.5 2672.3	2.47	6.51	.351 454	12 41.9
20	10 32 51.54 406.43	10 42 35.2 2693.2	2.48	6.53	.347 847	12 44.8
21	10 39 37.97 +398.90	+ 9 57 42.0 -2708.9	2.49	6.55	1.343 621	12 47.5
22	10 46 16.87 391.63	9 12 33.1 2720.5	2.50	6.57	.338 814	12 50.2
23	10 52 48.50 384.57	8 27 12.6 2727.9	2.51	6.60	.333 462	12 52.7
24	10 59 13.07 377.80	7 41 44.7 2731.4	2.52	6.63	.327 597	12 55.1
25	11 05 30.87 371.25	6 56 13.3 2731.4	2.53	6.66	.321 247	12 57.4
26	11 11 42.12 +364.94	+ 6 10 41.9 -2728.2	2.54	6.69	1.314 439	12 59.6
27	11 17 47.06 358.87	5 25 13.7 2721.8	2.56	6.73	.307 196	13 01.7
28	11 23 45.93 353.01	4 39 51.9 2712.8	2.57	6.77	.299 538	13 03.7
29	11 29 38.94 347.35	3 54 39.1 2701.2	2.59	6.81	.291 483	13 05.6
30	11 35 26.29 341.89	3 09 37.9 2686.8	2.61	6.86	.283 047	13 07.4
31	11 41 08.18 +336.60	+ 2 24 51.1 -2670.2	2.62	6.91	1.274 245	13 09.1
Sept. 1	11 46 44.78 331.47	1 40 20.9 2651.3	2.64	6.96	.265 088	13 10.7
2	11 52 16.25 326.48	0 56 09.6 2630.1	2.66	7.01	.255 586	13 12.3
3	11 57 42.73 321.62	+ 0 12 19.5 2607.1	2.68	7.06	.245 750	13 13.7
4	12 03 04.35 316.88	- 0 31 07.6 2581.9	2.70	7.12	.235 586	13 15.1
5	12 08 21.23 +312.19	- 1 14 09.5 -2554.6	2.73	7.18	1.225 101	13 16.4
6	12 13 33.42 307.59	1 56 44.1 2525.4	2.75	7.25	.214 300	13 17.6
7	12 18 41.01 303.02	2 38 49.5 2494.1	2.78	7.31	.203 189	13 18.7
8	12 23 44.03 298.47	3 20 23.6 2461.0	2.80	7.38	.191 771	13 19.8
9	12 28 42.50 293.94	4 01 24.6 2425.7	2.83	7.46	.180 048	13 20.8
10	12 33 36.44 +289.34	- 4 41 50.3 -2388.4	2.86	7.53	1.168 025	13 21.7
11	12 38 25.78 284.70	5 21 38.7 2348.9	2.89	7.61	.155 703	13 22.5
12	12 43 10.48 279.08	6 00 47.6 2307.3	2.92	7.70	.143 084	13 23.3
13	12 47 50.46 275.12	6 39 14.9 2263.5	2.96	7.79	.130 170	13 24.0
14	12 52 25.58 270.12	7 16 58.4 2217.1	2.99	7.88	.116 963	13 24.6
15	12 56 55.70 +264.91	- 7 53 55.5 -2168.2	3.03	7.97	1.103 464	13 25.1
16	13 01 20.61 259.48	8 30 03.7 2116.5	3.06	8.07	.089 675	13 25.5
17	13 05 40.09 253.75	9 05 20.2 2062.0	3.10	8.18	.075 598	13 25.9
18	13 09 53.84 247.68	9 39 42.2 2004.1	3.14	8.29	.061 236	13 26.1
19	13 14 01.52 241.24	10 13 06.3 1943.0	3.19	8.41	.046 593	13 26.2
20	13 18 02.76 +234.32	-10 45 29.3 -1877.9	3.24	8.53	1.031 674	13 26.2
21	13 21 57.08 226.91	11 16 47.2 1808.9	3.29	8.66	.016 484	13 26.1
22	13 25 43.99 218.87	11 46 56.1 1735.3	3.34	8.79	1.001 030	13 25.9
23	13 29 22.86 210.19	12 15 51.4 1656.7	3.39	8.93	.0985 323	13 25.5
24	13 32 53.05 200.75	12 43 28.1 1572.5	3.45	9.08	.969 375	13 25.0
25	13 36 13.80 +190.43	-13 09 40.6 -1482.6	3.51	9.23	0.953 201	13 24.3
26	13 39 24.23 179.20	13 34 23.2 1385.7	3.57	9.39	.936 820	13 23.4
27	13 42 23.43 166.91	13 57 28.9 1281.6	3.63	9.56	.920 254	13 22.3
28	13 45 10.34 153.44	14 18 50.5 1169.2	3.70	9.74	.903 532	13 21.1
29	13 47 43.78 138.74	14 38 19.7 1047.7	3.77	9.92	.886 686	13 19.5
30	13 50 02.52 +122.63	-14 55 47.4 -916.0	3.84	10.12	0.869 757	13 17.8
Oct. 1	13 52 05.15	-15 11 03.4	3.92	10.32	0.852 793	13 15.7

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	True Dist- ance from the Earth	Meri- dian Passage
Oct. 1	^{h m s} 13 52 05.15 ^{+105.05}	^{° ' "} -15 11 03.4 ^{-773.3}	3.92	10.32	0.852 793	^{h m} 13 15.7
2	13 53 50.20 ^{85.91}	15 23 56.7 ^{618.5}	4.00	10.53	.835 850	13 13.4
3	13 55 16.11 ^{65.13}	15 34 15.2 ^{450.2}	4.08	10.74	.818 994	13 10.7
4	13 56 21.24 ^{42.67}	15 41 45.4 ^{267.8}	4.17	10.97	.802 306	13 07.6
5	13 57 03.91 ^{+18.56}	15 46 13.2 ^{-70.2}	4.25	11.20	.785 877	13 04.2
6	13 57 22.47 ^{-7.15}	-15 47 23.4 ^{+143.2}	4.34	11.43	0.769 813	13 00.3
7	13 57 15.32 ^{34.25}	15 45 00.2 ^{372.4}	4.43	11.67	.754 237	12 56.0
8	13 56 41.07 ^{62.52}	15 38 47.8 ^{616.9}	4.52	11.90	.739 290	12 51.3
9	13 55 38.55 ^{91.46}	15 28 30.9 ^{875.1}	4.61	12.14	.725 130	12 46.1
10	13 54 07.09 ^{120.59}	15 13 55.8 ^{1143.6}	4.69	12.36	.711 933	12 40.4
11	13 52 06.50 ^{-149.10}	-14 54 52.2 ^{+1418.6}	4.77	12.57	0.699 894	12 34.2
12	13 49 37.40 ^{176.13}	14 31 13.6 ^{1692.9}	4.85	12.77	.689 224	12 27.5
13	13 46 41.27 ^{200.61}	14 03 00.7 ^{1958.2}	4.91	12.94	.680 143	12 20.5
14	13 43 20.66 ^{221.40}	13 30 22.5 ^{2204.0}	4.96	13.08	.672 881	12 13.1
15	13 39 39.26 ^{237.35}	12 53 38.5 ^{2418.2}	5.00	13.18	.667 663	12 05.3
16	13 35 41.91 ^{-247.37}	-12 13 20.3 ^{+2588.5}	5.02	13.24	0.664 704	11 57.4
17	13 31 34.54 ^{250.63}	11 30 11.8 ^{2703.2}	5.03	13.25	.664 198	11 49.3
18	13 27 23.91 ^{246.55}	10 45 08.6 ^{2752.7}	5.02	13.21	.666 303	11 41.3
19	13 23 17.36 ^{234.97}	9 59 15.9 ^{2730.6}	4.98	13.11	.671 132	11 33.3
20	13 19 22.39 ^{216.14}	9 13 45.3 ^{2635.9}	4.92	12.97	.678 743	11 25.6
21	13 15 46.25 ^{-190.78}	-8 29 49.4 ^{+2470.9}	4.85	12.77	0.689 134	11 18.3
22	13 12 35.47 ^{159.88}	7 48 38.5 ^{2243.7}	4.76	12.53	.702 237	11 11.5
23	13 09 55.59 ^{124.71}	7 11 14.8 ^{1965.0}	4.66	12.26	.717 925	11 05.2
24	13 07 50.88 ^{86.60}	6 38 29.8 ^{1647.9}	4.54	11.96	.736 012	10 59.4
25	13 06 24.28 ^{46.94}	6 11 01.9 ^{1305.9}	4.42	11.64	.756 267	10 54.3
26	13 05 37.34 ^{-6.94}	-5 49 16.0 ^{+952.1}	4.29	11.30	0.778 421	10 49.9
27	13 05 30.40 ^{+32.30}	5 33 23.9 ^{598.1}	4.16	10.97	.802 183	10 46.2
28	13 06 02.70 ^{69.93}	5 23 25.8 ^{+254.0}	4.04	10.64	.827 251	10 43.1
29	13 07 12.63 ^{105.34}	5 19 11.8 ^{-73.4}	3.92	10.31	.853 321	10 40.6
30	13 08 57.97 ^{138.10}	5 20 25.2 ^{378.3}	3.80	10.00	.880 099	10 38.7
31	13 11 16.07 ^{+167.96}	-5 26 43.5 ^{-657.2}	3.68	9.70	0.907 309	10 37.2
Nov. 1	13 14 04.03 ^{194.87}	5 37 40.7 ^{908.5}	3.57	9.41	.934 698	10 36.3
2	13 17 18.90 ^{218.84}	5 52 49.2 ^{1131.7}	3.47	9.15	.962 040	10 35.8
3	13 20 57.74 ^{240.03}	6 11 40.9 ^{1327.1}	3.38	8.90	.989 138	10 35.6
4	13 24 57.77 ^{258.60}	6 33 48.0 ^{1496.0}	3.29	8.66	1.015 824	10 35.8
5	13 29 16.37 ^{+274.79}	-6 58 44.0 ^{-1639.8}	3.21	8.44	1.041 958	10 36.3
6	13 33 51.16 ^{288.88}	7 26 03.8 ^{1761.0}	3.13	8.24	.067 428	10 37.1
7	13 38 40.04 ^{301.04}	7 55 24.8 ^{1860.9}	3.06	8.06	.092 145	10 38.1
8	13 43 41.08 ^{311.54}	8 26 25.7 ^{1941.9}	2.99	7.88	.116 043	10 39.2
9	13 48 52.62 ^{320.04}	8 58 47.6 ^{2006.2}	2.93	7.72	.139 073	10 40.5
10	13 54 13.26 ^{+328.46}	-9 32 13.8 ^{-2055.2}	2.88	7.58	1.161 201	10 42.0
11	13 59 41.72 ^{335.24}	10 06 29.0 ^{2090.6}	2.83	7.44	.182 407	10 43.6
12	14 05 16.96 ^{341.13}	10 41 19.6 ^{2114.6}	2.78	7.32	.202 683	10 45.3
13	14 10 58.09 ^{346.27}	11 16 34.2 ^{2128.1}	2.73	7.20	.222 027	10 47.1
14	14 16 44.36 ^{350.76}	11 52 02.3 ^{2132.1}	2.69	7.09	.240 446	10 48.9
15	14 22 35.12 ^{+354.75}	-12 27 34.4 ^{-2128.5}	2.65	6.99	1.257 950	10 50.9
16	14 28 29.87	-13 03 02.9	2.62	6.90	1.274 554	10 52.9

Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	True Dist- ance from the Earth	Meri- dian Passage
^h ^m 4 28 29.87 4 34 28.16 4 40 29.65 4 46 34.04 4 52 41.08 4 58 50.61 5 05 02.47 5 11 16.54 5 17 32.74 5 23 51.01 5 30 11.27 5 36 33.51 5 42 57.72 5 49 23.83 5 55 51.88 6 02 21.83 6 08 53.70 6 15 27.48 6 22 03.16 6 28 40.75 6 35 20.22 6 42 01.59 6 48 44.81 6 55 29.89 6 02 16.79 6 09 05.47 6 15 55.90 6 22 48.02 6 29 41.77 6 36 37.09 6 43 33.87 6 50 32.04 6 57 31.48 6 04 32.08 6 11 33.67 6 18 36.13 6 25 39.26 6 32 42.91 6 39 46.84 6 46 50.82 6 53 54.59 6 00 57.88 6 08 00.36 6 15 01.67 6 22 01.42 6 28 59.19 6 35 54.48	[°] ['] ["] -13 03 02.9 13 38 20.4 14 13 20.7 14 47 58.2 15 22 08.1 -15 55 46.0 16 28 48.0 17 01 10.7 17 32 50.7 18 03 45.5 -18 33 52.3 19 03 08.6 19 31 32.4 19 59 01.5 20 25 34.1 -20 51 08.0 21 15 42.0 21 39 14.0 22 01 42.6 22 23 06.1 -22 43 23.0 23 02 32.1 23 20 31.6 23 37 20.1 23 52 56.3 -24 07 18.8 24 20 26.0 24 32 16.8 24 42 49.7 24 52 03.2 -24 59 56.2 25 06 27.3 25 11 35.2 25 15 18.6 25 17 36.3 -25 18 27.3 25 17 50.1 25 15 43.9 25 12 07.6 25 07 00.5 -25 00 21.5 24 52 10.1 24 42 25.8 24 31 08.2 24 18 17.2 -24 03 52.8 -23 47 55.5	["] 2.62 2.59 2.56 2.53 2.51 2.48 2.46 2.44 2.42 2.41 2.39 2.38 2.37 2.36 2.35 2.34 2.33 2.32 2.31 2.31 2.31 2.30 2.31 2.31 2.31 2.31 2.32 2.33 2.34 2.34 2.35 2.36 2.37 2.39 2.40 2.42 2.43 2.45 2.47 2.50 2.52 2.54 2.57	["] 6.90 6.82 6.74 6.67 6.60 6.54 6.49 6.44 6.39 6.35 6.31 6.27 6.24 6.21 6.18 6.16 6.14 6.12 6.10 6.09 6.08 6.07 6.07 6.07 6.07 6.06 6.07 6.07 6.08 6.09 6.10 6.11 6.13 6.15 6.17 6.19 6.22 6.25 6.29 6.32 6.36 6.41 6.46 6.51 6.57 6.63 6.70 6.77	["] 1.274 554 .290 275 .305 133 .319 148 .332 341 1.344 734 .356 348 .367 203 .377 319 .386 714 1.395 407 .403 415 .410 754 .417 437 .423 479 1.428 893 .433 690 .437 899 .441 470 .444 471 1.446 889 .448 730 .449 997 .450 695 .450 825 1.450 388 .449 385 .447 814 .445 672 .442 955 1.439 660 .435 779 .431 307 .426 234 .420 552 1.414 250 .407 316 .399 737 .391 499 .382 588 1.372 986 .362 676 .351 641 .339 860 .327 313 1.313 981 1.299 843	^h ^m 10 52.9 10 54.9 10 57.0 10 59.2 11 01.4 11 03.6 11 05.9 11 08.2 11 10.5 11 12.9 11 15.3 11 17.8 11 20.3 11 22.8 11 25.3 11 27.9 11 30.5 11 33.1 11 35.8 11 38.5 11 41.3 11 44.0 11 46.8 11 49.7 11 52.5 11 55.4 11 58.3 12 01.3 12 04.2 12 07.2 12 10.2 12 13.3 12 16.4 12 19.5 12 22.6 12 25.7 12 28.8 12 31.9 12 35.0 12 38.2 12 41.3 12 44.4 12 47.5 12 50.6 12 53.6 12 56.6 12 59.6

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Jan. 1	^{h m s} 19 27 20.67 ^{+324.65}	^{° ′ ″} -23 02 31.1 ^{+ 589.4}	5.03	5.26	0.223 5315	^{h m} 12 49.3
2	19 32 45.32 ^{323.81}	22 52 41.7 ^{631.3}	5.03	5.26	.223 0731	12 50.7
3	19 38 09.13 ^{322.92}	22 42 10.4 ^{672.7}	5.04	5.27	.222 6043	12 52.2
4	19 43 32.05 ^{321.97}	22 30 57.7 ^{713.7}	5.05	5.28	.222 1248	12 53.6
5	19 48 54.02 ^{320.99}	22 19 04.0 ^{754.1}	5.05	5.28	.221 6346	12 55.0
6	19 54 15.01 ^{+319.95}	-22 06 29.9 ^{+ 793.9}	5.06	5.29	0.221 1336	12 56.4
7	19 59 34.96 ^{318.89}	21 53 16.0 ^{833.3}	5.06	5.29	.220 6217	12 57.8
8	20 04 53.85 ^{317.78}	21 39 22.7 ^{872.0}	5.07	5.30	.220 0989	12 59.2
9	20 10 11.63 ^{316.63}	21 24 50.7 ^{910.2}	5.07	5.31	.219 5652	13 00.5
10	20 15 28.26 ^{315.46}	21 09 40.5 ^{947.7}	5.07	5.31	.219 0205	13 01.8
11	20 20 43.72 ^{+314.26}	-20 53 52.8 ^{+ 984.6}	5.08	5.32	0.218 4650	13 03.1
12	20 25 57.98 ^{313.03}	20 37 28.2 ^{1020.9}	5.09	5.33	.217 8986	13 04.4
13	20 31 11.01 ^{311.78}	20 20 27.3 ^{1056.4}	5.09	5.33	.217 3214	13 05.7
14	20 36 22.79 ^{310.52}	20 02 50.9 ^{1091.3}	5.10	5.34	.216 7333	13 06.9
15	20 41 33.31 ^{309.24}	19 44 39.6 ^{1125.5}	5.11	5.35	.216 1345	13 08.2
16	20 46 42.55 ^{+307.94}	-19 25 54.1 ^{+1159.0}	5.12	5.36	0.215 5249	13 09.4
17	20 51 50.49 ^{306.65}	19 06 35.1 ^{1191.7}	5.12	5.36	.214 9045	13 10.5
18	20 56 57.14 ^{305.34}	18 46 43.4 ^{1223.9}	5.13	5.37	.214 2733	13 11.7
19	21 02 02.48 ^{304.02}	18 26 19.5 ^{1255.2}	5.14	5.38	.213 6313	13 12.8
20	21 07 06.50 ^{302.72}	18 05 24.3 ^{1285.8}	5.15	5.39	.212 9784	13 13.9
21	21 12 09.22 ^{+301.41}	-17 43 58.5 ^{+1315.6}	5.16	5.40	0.212 3146	13 15.0
22	21 17 10.63 ^{300.11}	17 22 02.9 ^{1344.8}	5.16	5.40	.211 6397	13 16.1
23	21 22 10.74 ^{298.81}	16 59 38.1 ^{1373.2}	5.17	5.41	.210 9537	13 17.1
24	21 27 09.55 ^{297.52}	16 36 44.9 ^{1400.7}	5.18	5.42	.210 2565	13 18.2
25	21 32 07.07 ^{296.24}	16 13 24.2 ^{1427.6}	5.19	5.43	.209 5481	13 19.2
26	21 37 03.31 ^{+294.99}	-15 49 36.6 ^{+1453.7}	5.20	5.44	0.208 8283	13 20.2
27	21 41 58.30 ^{293.73}	15 25 22.9 ^{1478.9}	5.21	5.45	.208 0970	13 21.1
28	21 46 52.03 ^{292.50}	15 00 44.0 ^{1503.5}	5.22	5.46	.207 3540	13 22.1
29	21 51 44.53 ^{291.28}	14 35 40.5 ^{1527.2}	5.23	5.47	.206 5993	13 23.0
30	21 56 35.81 ^{290.09}	14 10 13.3 ^{1550.2}	5.24	5.48	.205 8326	13 23.9
31	22 01 25.90 ^{+288.92}	-13 44 23.1 ^{+1572.4}	5.25	5.49	0.205 0538	13 24.8
Feb. 1	22 06 14.82 ^{287.76}	13 18 10.7 ^{1593.7}	5.26	5.50	.204 2626	13 25.6
2	22 11 02.58 ^{286.63}	12 51 37.0 ^{1614.3}	5.27	5.51	.203 4590	13 26.4
3	22 15 49.21 ^{285.53}	12 24 42.7 ^{1634.0}	5.28	5.52	.202 6426	13 27.3
4	22 20 34.74 ^{284.44}	11 57 28.7 ^{1653.0}	5.28	5.53	.201 8134	13 28.1
5	22 25 19.18 ^{+283.39}	-11 29 55.7 ^{+1671.1}	5.29	5.54	0.200 9712	13 28.9
6	22 30 02.57 ^{282.36}	11 02 04.6 ^{1688.4}	5.30	5.55	.200 1160	13 29.7
7	22 34 44.93 ^{281.36}	10 33 56.2 ^{1705.0}	5.31	5.56	.199 2477	13 30.4
8	22 39 26.29 ^{280.39}	10 05 31.2 ^{1720.7}	5.32	5.57	.198 3662	13 31.2
9	22 44 06.68 ^{279.46}	9 36 50.5 ^{1735.6}	5.33	5.58	.197 4714	13 31.9
10	22 48 46.14 ^{+278.54}	-9 07 54.9 ^{+1749.8}	5.35	5.60	0.196 5632	13 32.6
11	22 53 24.68 ^{277.68}	8 38 45.1 ^{1763.2}	5.36	5.61	.195 6414	13 33.3
12	22 58 02.36 ^{276.84}	8 09 21.9 ^{1775.8}	5.37	5.62	.194 7061	13 33.9
13	23 02 39.20 ^{276.04}	7 39 46.1 ^{1787.7}	5.38	5.63	.193 7572	13 34.6
14	23 07 15.24 ^{275.28}	7 09 58.4 ^{1798.7}	5.40	5.65	.192 7947	13 35.3
15	23 11 50.52 ^{+274.57}	-6 39 59.7 ^{+1809.1}	5.41	5.66	0.191 8187	13 35.9
16	23 16 25.09	-6 09 50.6	5.42	5.67	0.190 8291	13 36.5

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Feb. 16	^h 23 ^m 16 ^s 25.09 +273.88	— 6 09 50.6 —1818.6	5.42	5.67	0.190 8291	^h 13 ^m 36.5
17	23 20 58.97 +273.24	5 39 32.0 —1827.5	5.43	5.68	.189 8257	13 37.1
18	23 25 32.21 272.64	5 09 04.5 —1835.5	5.45	5.70	.188 8084	13 37.7
19	23 30 04.85 272.09	4 38 29.0 —1843.0	5.46	5.71	.187 7771	13 38.3
20	23 34 36.94 271.58	4 07 46.0 —1849.5	5.47	5.72	.186 7317	13 38.9
21	23 39 08.52 +271.09	— 3 36 56.5 +1855.4	5.49	5.74	0.185 6721	13 39.5
22	23 43 39.61 270.67	3 06 01.1 —1860.6	5.50	5.75	.184 5981	13 40.1
23	23 48 10.28 270.29	2 35 00.5 —1865.0	5.51	5.77	.183 5096	13 40.7
24	23 52 40.57 269.94	2 03 55.5 —1868.6	5.52	5.78	.182 4065	13 41.2
25	23 57 10.51 269.65	1 32 46.9 —1871.6	5.54	5.80	.181 2886	13 41.8
26	0 01 40.16 +269.39	— 1 01 35.3 +1873.9	5.55	5.81	0.180 1556	13 42.3
27	0 06 09.55 269.17	— 0 30 21.4 —1875.3	5.57	5.83	.179 0074	13 42.9
28	0 10 38.72 269.01	+ 0 00 53.9 —1876.0	5.58	5.84	.177 8438	13 43.4
Mar. 1	0 15 07.73 268.88	0 32 09.9 —1876.1	5.60	5.86	.176 6644	13 43.9
2	0 19 36.61 268.80	1 03 26.0 —1875.3	5.61	5.87	.175 4691	13 44.5
3	0 24 05.41 +268.76	+ 1 34 41.3 +1873.9	5.63	5.89	0.174 2574	13 45.0
4	0 28 34.17 268.76	2 05 55.2 —1871.6	5.65	5.91	.173 0291	13 45.5
5	0 33 02.93 268.79	2 37 06.8 —1868.6	5.66	5.92	.171 7841	13 46.1
6	0 37 31.72 268.86	3 08 15.4 —1864.8	5.68	5.94	.170 5222	13 46.6
7	0 42 00.58 268.97	3 39 20.2 —1860.3	5.70	5.96	.169 2431	13 47.2
8	0 46 29.55 +269.12	+ 4 10 20.5 +1855.1	5.71	5.98	0.167 9467	13 47.7
9	0 50 58.67 269.31	4 41 15.6 —1849.1	5.72	5.99	.166 6328	13 48.3
10	0 55 27.98 269.54	5 12 04.7 —1842.4	5.74	6.01	.165 3012	13 48.8
11	0 59 57.52 269.80	5 42 47.1 —1834.8	5.76	6.03	.163 9519	13 49.4
12	1 04 27.32 270.10	6 13 21.9 —1826.7	5.78	6.05	.162 5846	13 49.9
13	1 08 57.42 +270.43	+ 6 43 48.6 +1817.7	5.80	6.07	0.161 1993	13 50.5
14	1 13 27.85 270.81	7 14 06.3 —1808.0	5.82	6.09	.159 7959	13 51.0
15	1 17 58.66 271.22	7 44 14.3 —1797.5	5.84	6.11	.158 3743	13 51.6
16	1 22 29.88 271.67	8 14 11.8 —1786.5	5.86	6.13	.156 9345	13 52.2
17	1 27 01.55 272.15	8 43 58.3 —1774.6	5.88	6.15	.155 4761	13 52.8
18	1 31 33.70 +272.67	+ 9 13 32.9 +1762.0	5.90	6.17	0.153 9991	13 53.4
19	1 36 06.37 273.23	9 42 54.9 —1748.7	5.92	6.19	.152 5033	13 54.0
20	1 40 39.60 273.82	10 12 03.6 —1734.6	5.94	6.22	.150 9886	13 54.6
21	1 45 13.42 274.44	10 40 58.2 —1719.9	5.96	6.24	.149 4548	13 55.3
22	1 49 47.86 275.10	11 09 38.1 —1704.4	5.98	6.26	.147 9018	13 55.9
23	1 54 22.96 +275.78	+11 38 02.5 +1688.3	6.00	6.28	0.146 3295	13 56.5
24	1 58 58.74 276.50	12 06 10.8 —1671.3	6.02	6.30	.144 7376	13 57.2
25	2 03 35.24 277.25	12 34 02.1 —1653.6	6.05	6.33	.143 1260	13 57.9
26	2 08 12.49 278.02	13 01 35.7 —1635.3	6.07	6.35	.141 4944	13 58.6
27	2 12 50.51 278.83	13 28 51.0 —1616.2	6.10	6.38	.139 8425	13 59.3
28	2 17 29.34 +279.66	+13 55 47.2 +1596.4	6.12	6.40	0.138 1702	14 00.0
29	2 22 09.00 280.51	14 22 23.6 —1575.7	6.15	6.43	.136 4771	14 00.7
30	2 26 49.51 281.38	14 48 39.3 —1554.6	6.16	6.45	.134 7629	14 01.4
31	2 31 30.89 282.28	15 14 33.9 —1532.4	6.19	6.48	.133 0273	14 02.2
Apr. 1	2 36 13.17 283.18	15 40 06.3 —1509.8	6.21	6.50	.131 2700	14 03.0
2	2 40 56.35 +284.10	+16 05 16.1 +1486.1	6.24	6.53	0.129 4907	14 03.8
3	2 45 40.45	+16 30 02.2	6.27	6.56	0.127 6890	14 04.6

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Apr. 1	^{h m s} 2 36 13.17 +283.18	^{° ' "} +15 40 06.3 +1509.8	6.21	6.50	0.131 2700	^{h m} 14 03.0
2	2 40 56.35 284.10	16 05 16.1 1486.1	6.24	6.53	0.129 4907	14 03.8
3	2 45 40.45 285.03	16 30 02.2 1461.9	6.27	6.56	0.127 6890	14 04.6
4	2 50 25.48 285.98	16 54 24.1 1437.1	6.30	6.59	0.125 8645	14 05.4
5	2 55 11.46 286.92	17 18 21.2 1411.2	6.32	6.61	0.124 0171	14 06.2
6	2 59 58.38 +287.86	+17 41 52.4 +1384.9	6.35	6.64	0.122 1464	14 07.0
7	3 04 46.24 288.81	18 04 57.3 1357.7	6.37	6.67	0.120 2523	14 07.9
8	3 09 35.05 289.76	18 27 35.0 1329.9	6.40	6.70	0.118 3345	14 08.8
9	3 14 24.81 290.70	18 49 44.9 1301.4	6.43	6.73	0.116 3928	14 09.7
10	3 19 15.51 291.65	19 11 26.3 1272.2	6.46	6.76	0.114 4270	14 10.6
11	3 24 07.16 +292.57	+19 32 38.5 +1242.4	6.49	6.79	0.112 4370	14 11.5
12	3 28 59.73 293.50	19 53 20.9 1211.8	6.52	6.82	0.110 4225	14 12.5
13	3 33 53.23 294.42	20 13 32.7 1180.7	6.56	6.86	0.108 3835	14 13.4
14	3 38 47.65 295.32	20 33 13.4 1148.9	6.59	6.89	0.106 3197	14 14.4
15	3 43 42.97 296.20	20 52 22.3 1116.4	6.61	6.92	0.104 2310	14 15.4
16	3 48 39.17 +297.08	+21 10 58.7 +1083.5	6.64	6.95	0.102 1171	14 16.4
17	3 53 36.25 297.92	21 29 02.2 1049.8	6.68	6.99	0.099 9779	14 17.4
18	3 58 34.17 298.74	21 46 32.0 1015.7	6.71	7.02	0.097 8133	14 18.4
19	4 03 32.91 299.55	22 03 27.7 980.9	6.75	7.06	0.095 6229	14 19.5
20	4 08 32.46 300.32	22 19 48.6 945.6	6.79	7.10	0.093 4067	14 20.5
21	4 13 32.78 +301.07	+22 35 34.2 +909.9	6.81	7.13	0.091 1645	14 21.6
22	4 18 33.85 301.79	22 50 44.1 873.5	6.85	7.17	0.088 8960	14 22.7
23	4 23 35.64 302.47	23 05 17.6 836.7	6.89	7.21	0.086 6009	14 23.8
24	4 28 38.11 303.12	23 19 14.3 799.5	6.93	7.25	0.084 2792	14 24.9
25	4 33 41.23 303.74	23 32 33.8 761.7	6.97	7.29	0.081 9304	14 26.0
26	4 38 44.97 +304.30	+23 45 15.5 +723.6	7.01	7.33	0.079 5543	14 27.2
27	4 43 49.27 304.83	23 57 19.1 685.0	7.04	7.37	0.077 1504	14 28.3
28	4 48 54.10 305.30	24 08 44.1 646.0	7.08	7.41	0.074 7184	14 29.4
29	4 53 59.40 305.73	24 19 30.1 606.7	7.12	7.45	0.072 2579	14 30.6
30	4 59 05.13 306.11	24 29 36.8 567.0	7.16	7.49	0.069 7685	14 31.7
May 1	5 04 11.24 +306.42	+24 39 03.8 +527.1	7.21	7.54	0.067 2498	14 32.9
2	5 09 17.66 306.68	24 47 50.9 486.9	7.24	7.58	0.064 7013	14 34.1
3	5 14 24.34 306.88	24 55 57.8 446.3	7.29	7.63	0.062 1228	14 35.3
4	5 19 31.22 307.01	25 03 24.1 405.6	7.33	7.67	0.059 5137	14 36.4
5	5 24 38.23 307.07	25 10 09.7 364.7	7.38	7.72	0.056 8738	14 37.6
6	5 29 45.30 +307.06	+25 16 14.4 +323.7	7.43	7.77	0.054 2027	14 38.8
7	5 34 52.36 306.98	25 21 38.1 282.4	7.46	7.81	0.051 5000	14 39.9
8	5 39 59.34 306.84	25 26 20.5 241.2	7.51	7.86	0.048 7655	14 41.1
9	5 45 06.18 306.62	25 30 21.7 199.9	7.57	7.92	0.045 9989	14 42.3
10	5 50 12.80 306.33	25 33 41.6 158.5	7.62	7.97	0.043 2000	14 43.5
11	5 55 19.13 +305.97	+25 36 20.1 +117.2	7.66	8.02	0.040 3684	14 44.6
12	6 00 25.10 305.54	25 38 17.3 75.9	7.71	8.07	0.037 5039	14 45.8
13	6 05 30.64 305.04	25 39 33.2 34.7	7.76	8.12	0.034 6062	14 46.9
14	6 10 35.68 304.46	25 40 07.9 6.4	7.82	8.18	0.031 6752	14 48.1
15	6 15 40.14 303.82	25 40 01.5 47.4	7.87	8.24	0.028 7105	14 49.2
16	6 20 43.96 +303.10	+25 39 14.1 88.2	7.92	8.29	0.025 7119	14 50.3
17	6 25 47.06 302.10	+25 37 45.9 88.2	7.98	8.35	0.022 6792	14 51.4

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
May	^{h m s} 17 6 25 47.06 ^{+302.32}	^{° ' "} +25 37 45.9 ^{-128.9}	7.98	8.35	0.022 6792	^{h m} 14 51.4
	18 6 30 49.38 ^{301.46}	25 35 37.0 ^{169.2}	8.04	8.41	.019 6121	14 52.5
	19 6 35 50.84 ^{300.55}	25 32 47.8 ^{209.4}	8.09	8.47	.016 5103	14 53.6
	20 6 40 51.39 ^{299.57}	25 29 18.4 ^{249.3}	8.15	8.53	.013 3736	14 54.6
	21 6 45 50.96 ^{298.51}	25 25 09.1 ^{288.8}	8.21	8.59	.010 2017	14 55.6
	22 6 50 49.47 ^{+297.40}	+25 20 20.3 ^{-328.1}	8.28	8.66	0.006 9943	14 56.7
	23 6 55 46.87 ^{296.24}	25 14 52.2 ^{367.0}	8.33	8.72	.003 7511	14 57.7
	24 7 00 43.11 ^{295.01}	25 08 45.2 ^{405.5}	8.40	8.79	0.000 4716	14 58.7
	25 7 05 38.12 ^{293.72}	25 01 59.7 ^{443.7}	8.47	8.86	9.997 1555	14 59.6
	26 7 10 31.84 ^{292.38}	24 54 36.0 ^{481.3}	8.53	8.93	.993 8022	15 00.6
	27 7 15 24.22 ^{+290.98}	+24 46 34.7 ^{-518.5}	8.60	9.00	9.990 4113	15 01.5
	28 7 20 15.20 ^{289.53}	24 37 56.2 ^{555.2}	8.67	9.07	.986 9823	15 02.4
	29 7 25 04.73 ^{288.01}	24 28 41.0 ^{591.5}	8.73	9.14	.983 5146	15 03.2
	30 7 29 52.74 ^{286.44}	24 18 49.5 ^{627.2}	8.80	9.21	.980 0076	15 04.1
	31 7 34 39.18 ^{284.82}	24 08 22.3 ^{662.4}	8.88	9.29	.976 4607	15 04.9
June	1 7 39 24.00 ^{+283.14}	+23 57 19.9 ^{-696.9}	8.95	9.37	9.972 8736	15 05.7
	2 7 44 07.14 ^{281.40}	23 45 43.0 ^{730.8}	9.03	9.45	.969 2455	15 06.4
	3 7 48 48.54 ^{279.62}	23 33 32.2 ^{764.2}	9.11	9.53	.965 5759	15 07.2
	4 7 53 28.16 ^{277.78}	23 20 48.0 ^{796.8}	9.18	9.61	.961 8643	15 07.9
	5 7 58 05.94 ^{275.90}	23 07 31.2 ^{828.9}	9.26	9.69	.958 1103	15 08.5
	6 8 02 41.84 ^{+273.97}	+22 53 42.3 ^{-860.2}	9.35	9.78	9.954 3133	15 09.2
	7 8 07 15.81 ^{272.00}	22 39 22.1 ^{890.8}	9.42	9.86	.950 4728	15 09.8
	8 8 11 47.81 ^{269.98}	22 24 31.3 ^{920.7}	9.51	9.95	.946 5885	15 10.3
	9 8 16 17.79 ^{267.93}	22 09 10.6 ^{949.9}	9.60	10.04	.942 6598	15 10.9
	10 8 20 45.72 ^{265.83}	21 53 20.7 ^{978.4}	9.68	10.13	.938 6865	15 11.4
	11 8 25 11.55 ^{+263.69}	+21 37 02.3 ^{-1006.2}	9.78	10.23	9.934 6680	15 11.8
	12 8 29 35.24 ^{261.53}	21 20 16.1 ^{1033.2}	9.86	10.32	.930 6039	15 12.3
	13 8 33 56.77 ^{259.32}	21 03 02.9 ^{1059.4}	9.96	10.42	.926 4940	15 12.7
	14 8 38 16.09 ^{257.08}	20 45 23.5 ^{1084.9}	10.05	10.52	.922 3377	15 13.0
	15 8 42 33.17 ^{254.81}	20 27 18.6 ^{1109.7}	10.16	10.63	.918 1347	15 13.3
	16 8 46 47.98 ^{+252.52}	+20 08 48.9 ^{-1133.6}	10.25	10.73	9.913 8846	15 13.6
	17 8 51 00.50 ^{250.20}	19 49 55.3 ^{1156.9}	10.36	10.84	.909 5871	15 13.8
	18 8 55 10.70 ^{247.85}	19 30 38.4 ^{1179.3}	10.46	10.95	.905 2418	15 14.0
	19 8 59 18.55 ^{245.49}	19 10 59.1 ^{1201.1}	10.57	11.06	.900 8483	15 14.2
	20 9 03 24.04 ^{243.10}	18 50 58.0 ^{1222.0}	10.68	11.17	.896 4062	15 14.3
	21 9 07 27.14 ^{+240.68}	+18 30 36.0 ^{-1242.2}	10.79	11.29	9.891 9149	15 14.4
	22 9 11 27.82 ^{238.25}	18 09 53.8 ^{1261.8}	10.90	11.41	.887 3740	15 14.5
	23 9 15 26.07 ^{235.80}	17 48 52.0 ^{1280.4}	11.02	11.53	.882 7828	15 14.5
	24 9 19 21.87 ^{233.32}	17 27 31.6 ^{1298.4}	11.13	11.65	.878 1408	15 14.4
	25 9 23 15.19 ^{230.82}	17 05 53.2 ^{1315.5}	11.26	11.78	.873 4473	15 14.3
	26 9 27 06.01 ^{+228.29}	+16 43 57.7 ^{-1331.8}	11.38	11.91	9.868 7015	15 14.2
	27 9 30 54.30 ^{225.74}	16 21 45.9 ^{1347.3}	11.51	12.04	.863 9028	15 14.1
	28 9 34 40.04 ^{223.16}	15 59 18.6 ^{1362.1}	11.63	12.17	.859 0504	15 13.9
	29 9 38 23.20 ^{220.54}	15 36 36.5 ^{1375.9}	11.76	12.31	.854 1436	15 13.6
	30 9 42 03.74 ^{217.89}	15 13 40.6 ^{1388.9}	11.90	12.45	.849 1817	15 13.3
July	1 9 45 41.63 ^{+215.21}	+14 50 31.7 ^{-1401.2}	12.04	12.60	9.844 1640	15 13.0
	2 9 49 16.84	+14 27 10.5	12.18	12.75	9.839 0898	15 12.6

Date	Apparent Right Ascension	Apparent Declination	Semi- diameter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
July	^{h m s}	^{° ' "}				^{h m}
1	9 45 41.63 +215.21	+14 50 31.7 -1401.2	12.04	12.60	9.844 1640	15 13.0
2	9 49 16.84 212.48	14 27 10.5 -1412.4	12.18	12.75	.839 0898	15 12.6
3	9 52 49.32 209.71	14 03 38.1 -1422.9	12.33	12.90	.833 9584	15 12.2
4	9 56 19.03 206.91	13 39 55.2 -1432.5	12.47	13.05	.828 7693	15 11.7
5	9 59 45.94 204.05	13 16 02.7 -1441.1	12.62	13.21	.823 5218	15 11.2
6	10 03 09.99 +201.16	+12 52 01.6 -1448.9	12.78	13.37	9.818 2155	15 10.6
7	10 06 31.15 198.20	12 27 52.7 -1455.9	12.94	13.54	.812 8499	15 10.0
8	10 09 49.35 195.20	12 03 36.8 -1461.8	13.10	13.71	.807 4246	15 09.3
9	10 13 04.55 192.15	11 39 15.0 -1467.0	13.26	13.88	.801 9393	15 08.6
10	10 16 16.70 189.03	11 14 48.0 -1471.1	13.44	14.06	.796 3936	15 07.8
11	10 19 25.73 +185.85	+10 50 16.9 -1474.4	13.62	14.25	9.790 7873	15 07.0
12	10 22 31.58 182.60	10 25 42.5 -1476.6	13.79	14.43	.785 1202	15 06.1
13	10 25 34.18 179.30	10 01 05.9 -1478.0	13.97	14.62	.779 3921	15 05.2
14	10 28 33.48 175.92	9 36 27.9 -1478.4	14.16	14.82	.773 6031	15 04.2
15	10 31 29.40 172.47	9 11 49.5 -1477.9	14.35	15.02	.767 7532	15 03.1
16	10 34 21.87 +168.95	+ 8 47 11.6 -1476.5	14.56	15.23	9.761 8426	15 02.0
17	10 37 10.82 165.34	8 22 35.1 -1473.9	14.76	15.44	.755 8717	15 00.9
18	10 39 56.16 161.67	7 58 01.2 -1470.7	14.96	15.65	.749 8409	14 59.6
19	10 42 37.83 157.90	7 33 30.5 -1466.2	15.18	15.88	.743 7501	14 58.3
20	10 45 15.73 154.05	7 09 04.3 -1460.9	15.39	16.10	.737 5999	14 57.0
21	10 47 49.78 +150.10	+ 6 44 43.4 -1454.6	15.61	16.33	9.731 3907	14 55.6
22	10 50 19.88 146.06	6 20 28.8 -1447.1	15.84	16.57	.725 1231	14 54.1
23	10 52 45.94 141.91	5 56 21.7 -1438.5	16.07	16.81	.718 7974	14 52.6
24	10 55 07.85 137.64	5 32 23.2 -1428.9	16.30	17.06	.712 4142	14 50.9
25	10 57 25.49 133.26	5 08 34.3 -1417.9	16.55	17.32	.705 9743	14 49.2
26	10 59 38.75 +128.74	+ 4 44 56.4 -1405.8	16.80	17.58	9.699 4788	14 47.5
27	11 01 47.49 124.10	4 21 30.6 -1392.4	17.06	17.85	.692 9286	14 45.7
28	11 03 51.59 119.29	3 58 18.2 -1377.7	17.32	18.12	.686 3249	14 43.7
29	11 05 50.88 114.34	3 35 20.5 -1361.5	17.58	18.40	.679 6692	14 41.7
30	11 07 45.22 109.23	3 12 39.0 -1343.8	17.86	18.69	.672 9634	14 39.6
31	11 09 34.45 +103.94	+ 2 50 15.2 -1324.7	18.14	18.98	9.666 2097	14 37.5
Aug. 1	11 11 18.39 98.50	2 28 10.5 -1303.9	18.43	19.28	.659 4106	14 35.2
2	11 12 56.89 92.88	2 06 26.6 -1281.5	18.72	19.58	.652 5692	14 32.8
3	11 14 29.77 87.05	1 45 05.1 -1257.3	19.02	19.90	.645 6886	14 30.4
4	11 15 56.82 81.04	1 24 07.8 -1231.5	19.32	20.22	.638 7726	14 27.8
5	11 17 17.86 +74.84	+ 1 03 36.3 -1203.6	19.63	20.54	9.631 8253	14 25.2
6	11 18 32.70 68.43	0 43 32.7 -1174.0	19.95	20.87	.624 8521	14 22.4
7	11 19 41.13 61.81	0 23 58.7 -1142.0	20.27	21.21	.617 8582	14 19.6
8	11 20 42.94 55.01	+ 0 04 56.7 -1108.1	20.60	21.56	.610 8495	14 16.6
9	11 21 37.95 47.99	- 0 13 31.4 -1072.2	20.94	21.91	.603 8327	14 13.5
10	11 22 25.94 +40.79	- 0 31 23.6 -1034.0	21.28	22.27	9.596 8154	14 10.3
11	11 23 06.73 33.38	0 48 37.6 -993.5	21.63	22.63	.589 8060	14 07.0
12	11 23 40.11 25.78	1 05 11.1 -950.5	21.98	23.00	.582 8137	14 03.5
13	11 24 05.89 18.02	1 21 01.6 -905.3	22.33	23.37	.575 8484	14 00.0
14	11 24 23.91 10.12	1 36 06.9 -857.5	22.69	23.74	.568 9209	13 56.3
15	11 24 34.03 + 2.05	- 1 50 24.4 -807.3	23.05	24.12	9.562 0429	13 52.4
16	11 24 36.08 2.05	- 2 03 51.7	23.41	24.50	9.555 2271	13 48.4

VENUS, 1935

197

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Aug. 16	^{h m s} 11 24 36.08	^{° ' "} - 2 03 51.7	["] 23.41	["] 24.50	9.555 2271	^{h m} 13 48.4
17	11 24 29.95	2 16 26.4	23.79	24.89	.548 4869	13 44.3
18	11 24 15.56	2 28 06.0	24.15	25.27	.541 8364	13 40.1
19	11 23 52.83	2 38 48.0	24.52	25.66	.535 2906	13 35.7
20	11 23 21.72	2 48 29.9	24.89	26.04	.528 8648	13 31.1
21	11 22 42.21	2 57 09.2	25.25	26.42	9.522 5757	13 26.5
22	11 21 54.34	3 04 43.5	25.60	26.79	.516 4407	13 21.7
23	11 20 58.15	3 11 10.5	25.96	27.16	.510 4782	13 16.8
24	11 19 53.75	3 16 28.0	26.31	27.53	.504 7066	13 11.7
25	11 18 41.29	3 20 34.1	26.65	27.88	.499 1456	13 06.5
26	11 17 20.97	3 23 26.8	26.98	28.23	9.493 8148	13 01.1
27	11 15 53.07	3 25 04.6	27.29	28.56	.488 7344	12 55.7
28	11 14 17.88	3 25 26.2	27.60	28.88	.483 9248	12 50.1
29	11 12 35.78	3 24 30.6	27.89	29.18	.479 4066	12 44.4
30	11 10 47.23	3 22 17.5	28.16	29.46	.475 2003	12 38.7
31	11 08 52.73	3 18 46.9	28.41	29.73	9.471 3257	12 32.8
Sept. 1	11 06 52.81	3 13 59.0	28.64	29.97	.467 8020	12 26.8
2	11 04 48.12	3 07 54.9	28.85	30.19	.464 6469	12 20.8
3	11 02 39.35	3 00 36.3	29.03	30.38	.461 8772	12 14.7
4	11 00 27.22	2 52 05.0	29.20	30.55	.459 5079	12 08.6
5	10 58 12.51	2 42 24.1	29.33	30.69	9.457 5524	12 02.4
6	10 55 56.04	2 31 36.9	29.43	30.79	.456 0222	11 56.2
7	10 53 38.65	2 19 47.1	29.50	30.87	.454 9262	11 50.0
8	10 51 21.23	2 06 59.2	29.55	30.92	.454 2709	11 43.8
9	10 49 04.63	1 53 18.3	29.56	30.93	.454 0600	11 37.6
10	10 46 49.76	1 38 49.8	29.55	30.92	9.454 2947	11 31.5
11	10 44 37.47	1 23 39.5	29.50	30.87	.454 9735	11 25.4
12	10 42 28.64	1 07 53.4	29.43	30.79	.456 0917	11 19.4
13	10 40 24.07	0 51 37.9	29.32	30.68	.457 6416	11 13.4
14	10 38 24.55	0 34 59.2	29.19	30.54	.459 6131	11 07.5
15	10 36 30.79	0 18 04.0	29.02	30.37	9.461 9936	11 01.8
16	10 34 43.47	0 00 58.6	28.84	30.18	.464 7683	10 56.1
17	10 33 03.19	0 16 10.9	28.63	29.96	.467 9206	10 50.6
18	10 31 30.48	0 33 18.7	28.40	29.72	.471 4322	10 45.2
19	10 30 05.78	0 50 18.9	28.15	29.46	.475 2834	10 39.9
20	10 28 49.47	1 07 06.4	27.89	29.18	9.479 4538	10 34.8
21	10 27 41.87	1 23 36.3	27.60	28.88	.483 9226	10 29.8
22	10 26 43.23	1 39 44.2	27.30	28.56	.488 6687	10 24.9
23	10 25 53.75	1 55 25.8	26.99	28.24	.493 6708	10 20.2
24	10 25 13.53	2 10 37.6	26.66	27.90	.498 9081	10 15.7
25	10 24 42.64	2 25 16.0	26.33	27.55	9.504 3603	10 11.3
26	10 24 21.10	2 39 18.2	25.99	27.20	.510 0073	10 07.1
27	10 24 08.90	2 52 41.6	25.64	26.83	.515 8296	10 03.0
28	10 24 05.97	3 05 24.1	25.30	26.47	.521 8087	9 59.1
29	10 24 12.20	3 17 23.6	24.94	26.09	.527 9271	9 55.4
30	10 24 27.47	3 28 38.5	24.58	25.72	9.534 1680	9 51.8
Oct. 1	10 24 51.63	3 39 07.6	24.23	25.35	9.540 5155	9 48.3

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Oct. 1	^{h m s} 10 24 51.63 + 32.88	^{° ' "} + 3 39 07.6 + 582.1	24.23	25.35	9.540 5155	^{h m} 9 48.3
2	10 25 24.51 41.39	3 48 49.7 + 534.3	23.87	24.98	.546 9548	9 45.0
3	10 26 05.90 49.69	3 57 44.0 485.8	23.51	24.60	.553 4722	9 41.8
4	10 26 55.59 57.78	4 05 49.8 436.9	23.16	24.23	.560 0549	9 38.7
5	10 27 53.37 65.65	4 13 06.7 387.5	22.81	23.87	.566 6910	9 35.8
6	10 28 59.02 + 73.29	+ 4 19 34.2 + 338.0	22.46	23.50	9.573 3693	9 33.0
7	10 30 12.31 80.70	4 25 12.2 + 288.5	22.11	23.14	.580 0794	9 30.3
8	10 31 33.01 87.86	4 30 00.7 239.0	21.78	22.79	.586 8118	9 27.8
9	10 33 00.87 94.78	4 33 59.7 189.6	21.44	22.43	.593 5581	9 25.3
10	10 34 35.65 101.49	4 37 09.3 140.5	21.11	22.09	.600 3101	9 23.0
11	10 36 17.14 + 107.96	+ 4 39 29.8 + 91.6	20.79	21.75	9.607 0603	9 20.8
12	10 38 05.10 114.19	4 41 01.4 + 43.3	20.46	21.41	.613 8017	9 18.7
13	10 39 59.29 120.19	4 41 44.7 + 4.6	20.15	21.08	.620 5281	9 16.7
14	10 41 59.48 125.97	4 41 40.1 52.0	19.84	20.76	.627 2335	9 14.8
15	10 44 05.45 131.51	4 40 48.1 98.5	19.53	20.44	.633 9126	9 13.0
16	10 46 16.96 + 136.84	+ 4 39 09.6 - 144.5	19.24	20.13	9.640 5604	9 11.3
17	10 48 33.80 141.93	4 36 45.1 189.7	18.95	19.83	.647 1727	9 09.7
18	10 50 55.73 146.82	4 33 35.4 234.0	18.66	19.53	.653 7456	9 08.1
19	10 53 22.55 151.49	4 29 41.4 277.6	18.39	19.24	.660 2756	9 06.7
20	10 55 54.04 155.95	4 25 03.8 320.2	18.11	18.95	.666 7599	9 05.3
21	10 58 29.99 + 160.23	+ 4 19 43.6 - 361.9	17.85	18.68	9.673 1959	9 04.0
22	11 01 10.22 164.32	4 13 41.7 402.8	17.59	18.40	.679 5814	9 02.7
23	11 03 54.54 168.23	4 06 58.9 442.7	17.34	18.14	.685 9145	9 01.5
24	11 06 42.77 171.96	3 59 36.2 481.8	17.09	17.88	.692 1937	9 00.4
25	11 09 34.73 175.53	3 51 34.4 520.0	16.84	17.62	.698 4178	8 59.4
26	11 12 30.26 + 178.94	+ 3 42 54.4 - 557.2	16.60	17.37	9.704 5856	8 58.4
27	11 15 29.20 182.21	3 33 37.2 593.5	16.37	17.13	.710 6964	8 57.4
28	11 18 31.41 185.32	3 23 43.7 628.9	16.14	16.89	.716 7495	8 56.6
29	11 21 36.73 188.30	3 13 14.8 663.3	15.92	16.66	.722 7445	8 55.7
30	11 24 45.03 191.16	3 02 11.5 696.8	15.71	16.44	.728 6810	8 54.9
31	11 27 56.19 + 193.89	+ 2 50 34.7 - 729.6	15.50	16.22	9.734 5590	8 54.2
Nov. 1	11 31 10.08 196.52	2 38 25.1 761.3	15.29	16.00	.740 3784	8 53.5
2	11 34 26.60 199.03	2 25 43.8 792.1	15.09	15.79	.746 1394	8 52.8
3	11 37 45.63 201.45	2 12 31.7 822.3	14.89	15.58	.751 8421	8 52.2
4	11 41 07.08 203.78	1 58 49.4 851.4	14.70	15.38	.757 4867	8 51.7
5	11 44 30.86 + 206.03	+ 1 44 38.0 - 879.8	14.51	15.18	9.763 0735	8 51.1
6	11 47 56.89 208.20	1 29 58.2 907.3	14.33	14.99	.768 6030	8 50.6
7	11 51 25.09 210.29	1 14 50.9 933.9	14.14	14.80	.774 0753	8 50.2
8	11 54 55.38 212.32	0 59 17.0 959.7	13.97	14.62	.779 4908	8 49.8
9	11 58 27.70 214.28	0 43 17.3 984.6	13.80	14.44	.784 8496	8 49.4
10	12 02 01.98 + 216.19	+ 0 26 52.7 - 1008.6	13.64	14.27	9.790 1522	8 49.0
11	12 05 38.17 218.04	0 10 04.1 1031.8	13.48	14.10	.795 3988	8 48.7
12	12 09 16.21 219.84	0 07 07.7 1054.1	13.31	13.93	.800 5896	8 48.4
13	12 12 56.05 221.58	0 24 41.8 1075.5	13.15	13.76	.805 7248	8 48.1
14	12 16 37.63 223.27	0 42 37.3 1095.9	13.00	13.60	.810 8046	8 47.9
15	12 20 20.90 + 224.91	- 1 00 53.2 - 1115.4	12.85	13.45	9.815 8295	8 47.7
16	12 24 05.81 226.66	- 1 19 28.6 - 1135.4	12.70	13.29	9.820 7997	8 47.5

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Nov. 16	^h 12 ^m 24 ^s 05.81 +226.51	[°] - 1 ['] 19 ["] 28.6 -1134.1	12.70	13.29	9.820 7997	^h 8 ^m 47.5
17	12 27 52.32 228.07	1 38 22.7 1151.7	12.57	13.15	.825 7155	8 47.3
18	12 31 40.39 229.60	1 57 34.4 1168.4	12.42	13.00	.830 5774	8 47.2
19	12 35 29.99 231.06	2 17 02.8 1184.2	12.29	12.86	.835 3858	8 47.1
20	12 39 21.05 232.52	2 36 47.0 1199.0	12.16	12.72	.840 1413	8 47.0
21	12 43 13.57 +233.94	- 2 56 46.0 -1213.0	12.02	12.58	9.844 8445	8 46.9
22	12 47 07.51 235.33	3 16 59.0 1226.0	11.89	12.44	.849 4961	8 46.9
23	12 51 02.84 236.70	3 37 25.0 1238.1	11.76	12.31	.854 0965	8 46.9
24	12 54 59.54 238.04	3 58 03.1 1249.3	11.65	12.19	.858 6465	8 46.9
25	12 58 57.58 239.37	4 18 52.4 1259.5	11.53	12.06	.863 1465	8 46.9
26	13 02 56.95 +240.67	- 4 39 51.9 -1268.9	11.41	11.94	9.867 5972	8 47.0
27	13 06 57.62 241.96	5 01 00.8 1277.3	11.30	11.82	.871 9993	8 47.1
28	13 10 59.58 243.24	5 22 18.1 1285.0	11.18	11.70	.876 3535	8 47.2
29	13 15 02.82 244.51	5 43 43.1 1291.6	11.07	11.58	.880 6607	8 47.3
30	13 19 07.33 245.77	6 05 14.7 1297.4	10.96	11.47	.884 9216	8 47.4
Dec. 1	13 23 13.10 +247.03	- 6 26 52.1 -1302.4	10.86	11.36	9.889 1369	8 47.6
2	13 27 20.13 248.28	6 48 34.5 1306.6	10.75	11.25	.893 3074	8 47.8
3	13 31 28.41 249.53	7 10 21.1 1309.7	10.65	11.14	.897 4338	8 48.0
4	13 35 37.94 250.79	7 32 10.8 1312.2	10.55	11.04	.901 5168	8 48.2
5	13 39 48.73 252.05	7 54 03.0 1313.7	10.46	10.94	.905 5571	8 48.4
6	13 44 00.78 +253.32	- 8 15 56.7 -1314.4	10.36	10.84	9.909 5553	8 48.7
7	13 48 14.10 254.60	8 37 51.1 1314.2	10.26	10.74	.913 5118	8 49.0
8	13 52 28.70 255.88	8 59 45.3 1313.2	10.17	10.64	.917 4272	8 49.3
9	13 56 44.58 257.17	9 21 38.5 1311.3	10.08	10.55	.921 3020	8 49.6
10	14 01 01.75 258.47	9 43 29.8 1308.6	10.00	10.46	.925 1367	8 50.0
11	14 05 20.22 +259.77	-10 05 18.4 -1304.8	9.90	10.36	9.928 9316	8 50.4
12	14 09 39.99 261.08	10 27 03.2 1300.3	9.82	10.28	.932 6870	8 50.7
13	14 14 01.07 262.40	10 48 43.5 1294.9	9.74	10.19	.936 4035	8 51.1
14	14 18 23.47 263.72	11 10 18.4 1288.6	9.65	10.10	.940 0813	8 51.6
15	14 22 47.19 265.05	11 31 47.0 1281.3	9.58	10.02	.943 7208	8 52.1
16	14 27 12.24 +266.38	-11 53 08.3 -1273.2	9.49	9.93	9.947 3223	8 52.6
17	14 31 38.62 267.71	12 14 21.5 1264.2	9.41	9.85	.950 8862	8 53.1
18	14 36 06.33 269.05	12 35 25.7 1254.3	9.34	9.77	.954 4128	8 53.6
19	14 40 35.38 270.38	12 56 20.0 1243.4	9.27	9.70	.957 9027	8 54.1
20	14 45 05.76 271.72	13 17 03.4 1231.8	9.19	9.62	.961 3561	8 54.7
21	14 49 37.48 +273.06	-13 37 35.2 -1219.2	9.12	9.54	9.964 7735	8 55.3
22	14 54 10.54 274.39	13 57 54.4 1205.7	9.05	9.47	.968 1554	8 55.9
23	14 58 44.93 275.73	14 18 00.1 1191.5	8.98	9.40	.971 5021	8 56.6
24	15 03 20.66 277.07	14 37 51.6 1176.3	8.92	9.33	.974 8140	8 57.2
25	15 07 57.73 278.39	14 57 27.9 1160.2	8.85	9.26	.978 0917	8 57.9
26	15 12 36.12 +279.72	-15 16 48.1 -1143.4	8.78	9.19	9.981 3356	8 58.6
27	15 17 15.84 281.04	15 35 51.5 1125.7	8.72	9.12	.984 5463	8 59.3
28	15 21 56.88 282.36	15 54 37.2 1107.1	8.65	9.05	.987 7242	9 00.1
29	15 26 39.24 283.68	16 13 04.3 1087.8	8.59	8.99	.990 8699	9 00.8
30	15 31 22.92 284.98	16 31 12.1 1067.6	8.53	8.92	.993 9839	9 01.6
31	15 36 07.90 +286.29	-16 48 59.7 -1046.7	8.47	8.86	9.997 0667	9 02.5
32	15 40 54.19	-17 06 26.4	8.41	8.80	0.000 1189	9 03.3

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Jan. 1	^{h m s} 12 39 08.52	^{° ' "} - 1 48 17.6	3.48	6.54	0.128 9336	^{h m} 5 59.7
2	12 40 45.48 ⁺ 96.96	1 57 49.7 -572.1	3.51	6.59	.125 7021 -32315	5 57.4
3	12 42 21.59 96.11	2 07 15.2 565.5	3.53	6.64	.122 4435 32586	5 55.0
4	12 43 56.82 95.23	2 16 33.8 558.6	3.56	6.69	.119 1581 32854	5 52.7
5	12 45 31.15 94.33	2 25 45.6 551.8	3.58	6.74	.115 8458 33123	5 50.3
6	12 47 04.56 ⁺ 92.48	2 34 50.3 -544.7	3.61	6.79	.112 5068 33390	5 47.9
7	12 48 37.04 91.52	2 43 47.8 -537.5	3.64	6.84	.109 1411 -33657	5 45.5
8	12 50 08.56 90.54	2 52 38.0 530.2	3.67	6.90	.105 7490 33921	5 43.1
9	12 51 39.10 89.55	3 01 20.8 522.8	3.70	6.95	.102 3305 34185	5 40.7
10	12 53 08.65 88.53	3 09 56.1 515.3	3.73	7.01	.098 8858 34447	5 38.2
11	12 54 37.18 ⁺ 87.49	3 18 23.8 -507.7	3.76	7.06	.095 4151 34707	5 35.8
12	12 56 04.67 86.43	3 26 43.8 -500.0	3.79	7.12	.091 9184 -34967	5 33.3
13	12 57 31.10 85.37	3 34 56.0 492.2	3.82	7.18	.088 3957 35227	5 30.8
14	12 58 56.47 84.26	3 43 00.2 484.2	3.85	7.24	.084 8472 35485	5 28.2
15	13 00 20.73 83.15	3 50 56.4 476.2	3.88	7.30	.081 2728 35744	5 25.7
16	13 01 43.88 ⁺ 82.01	3 58 44.5 -468.1	3.92	7.36	.077 6726 36002	5 23.1
17	13 03 05.89 80.83	4 06 24.2 -459.7	3.95	7.42	.074 0466 -36260	5 20.6
18	13 04 26.72 79.63	4 13 55.5 451.3	3.98	7.48	.070 3950 36516	5 18.0
19	13 05 46.35 78.41	4 21 18.2 442.7	4.02	7.55	.066 7177 36773	5 15.4
20	13 07 04.76 77.15	4 28 32.2 434.0	4.05	7.61	.063 0149 37028	5 12.7
21	13 08 21.91 ⁺ 75.87	4 35 37.3 -425.1	4.08	7.68	.059 2866 37283	5 10.1
22	13 09 37.78 74.54	4 42 33.4 -416.1	4.11	7.74	.055 5331 -37535	5 07.4
23	13 10 52.32 73.19	4 49 20.3 406.9	4.15	7.81	.051 7544 37787	5 04.7
24	13 12 05.51 71.81	4 55 57.9 397.6	4.19	7.88	.047 9509 38035	5 02.0
25	13 13 17.32 70.38	5 02 26.0 388.1	4.23	7.95	.044 1226 38283	4 59.2
26	13 14 27.70 ⁺ 68.92	5 08 44.4 -378.4	4.26	8.02	.040 2698 38528	4 56.4
27	13 15 36.62 67.43	5 14 52.9 -368.5	4.30	8.09	.036 3929 -38769	4 53.6
28	13 16 44.05 65.89	5 20 51.4 358.5	4.34	8.17	.032 4923 39006	4 50.8
29	13 17 49.94 64.30	5 26 39.7 348.3	4.38	8.24	.028 5685 39238	4 48.0
30	13 18 54.24 62.69	5 32 17.6 337.9	4.42	8.31	.024 6219 39466	4 45.1
31	13 19 56.93 ⁺ 61.03	5 37 45.0 -327.4	4.46	8.39	.020 6532 39687	4 42.2
Feb. 1	13 20 57.96 59.32	5 43 01.7 -316.7	4.51	8.47	.016 6631 -39901	4 39.3
2	13 21 57.28 57.58	5 48 07.4 305.7	4.55	8.55	.012 6522 40109	4 36.3
3	13 22 54.86 55.79	5 53 02.2 294.8	4.59	8.63	.008 6211 40311	4 33.4
4	13 23 50.65 53.96	5 57 45.8 283.6	4.64	8.71	.004 5709 40502	4 30.4
5	13 24 44.61 ⁺ 52.11	6 02 18.1 -272.3	4.68	8.79	.000 5025 40684	4 27.3
6	13 25 36.72 50.20	6 06 38.9 -260.8	4.72	8.87	9.996 4169 -40856	4 24.2
7	13 26 26.92 48.26	6 10 48.2 249.3	4.77	8.96	.992 3150 41019	4 21.1
8	13 27 15.18 46.29	6 14 45.7 237.5	4.81	9.04	.988 1981 41169	4 18.0
9	13 28 01.47 44.27	6 18 31.5 225.8	4.86	9.13	.984 0669 41312	4 14.8
10	13 28 45.74 ⁺ 42.22	6 22 05.2 -213.7	4.90	9.22	.979 9225 41444	4 11.6
11	13 29 27.96 40.13	6 25 26.9 -201.7	4.95	9.30	.975 7658 -41567	4 08.4
12	13 30 08.09 37.99	6 28 36.4 189.5	5.00	9.39	.971 5982 41676	4 05.1
13	13 30 46.08 35.82	6 31 33.6 177.2	5.05	9.49	.967 4205 41777	4 01.8
14	13 31 21.90 33.60	6 34 18.2 164.6	5.10	9.58	.963 2341 41864	3 58.5
15	13 31 55.50 ⁺ 31.35	6 36 50.2 -152.0	5.15	9.67	.959 0400 41941	3 55.1
16	13 32 26.85 29.18	6 39 09.4 -139.2	5.19	9.76	.954 8397 -42003	3 51.7

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Feb. 16	^h 13 ^m 32 ^s 26.85 ⁺ 29.03	— 6° 39' 09.4 ⁺ 126.3	5.19	9.76	9.954 8397 ⁺ 42052	^h 3 ^m 51.7
17	13 32 55.88 ⁺ 26.69	6 41 15.7 ⁺ 113.1	5.24	9.86	.950 6345 ⁺ 42087	3 48.2
18	13 33 22.57 ⁺ 24.29	6 43 08.8 ⁺ 99.7	5.30	9.96	.946 4258 ⁺ 42105	3 44.7
19	13 33 46.86 ⁺ 21.86	6 44 48.5 ⁺ 86.2	5.35	10.05	.942 2153 ⁺ 42107	3 41.2
20	13 34 08.72 ⁺ 19.37	6 46 14.7 ⁺ 72.6	5.40	10.15	.938 0046 ⁺ 42091	3 37.6
21	13 34 28.09 ⁺ 16.83	— 6 47 27.3 ⁺ 58.8	5.45	10.25	9.933 7955 ⁺ 42057	3 34.0
22	13 34 44.92 ⁺ 14.27	6 48 26.1 ⁺ 44.9	5.51	10.35	.929 5898 ⁺ 42004	3 30.3
23	13 34 59.19 ⁺ 11.64	6 49 11.0 ⁺ 30.7	5.56	10.45	.925 3894 ⁺ 41926	3 26.6
24	13 35 10.83 ⁺ 8.98	6 49 41.7 ⁺ 16.5	5.61	10.55	.921 1968 ⁺ 41827	3 22.9
25	13 35 19.81 ⁺ 6.27	6 49 58.2 ⁺ 2.0	5.67	10.65	.917 0141 ⁺ 41706	3 19.1
26	13 35 26.08 ⁺ 3.52	— 6 50 00.2 ⁺ 12.5	5.72	10.76	9.912 8435 ⁺ 41560	3 15.2
27	13 35 29.60 ⁺ 0.73	6 49 47.7 ⁺ 27.3	5.78	10.86	.908 6875 ⁺ 41384	3 11.4
28	13 35 30.33 ⁺ 2.10	6 49 20.4 ⁺ 42.1	5.83	10.96	.904 5491 ⁺ 41180	3 07.4
Mar. 1	13 35 28.23 ⁺ 4.96	6 48 38.3 ⁺ 56.9	5.89	11.07	.900 4311 ⁺ 40946	3 03.5
2	13 35 23.27 ⁺ 7.85	6 47 41.4 ⁺ 71.9	5.94	11.17	.896 3365 ⁺ 40683	2 59.5
3	13 35 15.42 ⁺ 10.78	— 6 46 29.5 ⁺ 86.9	6.00	11.28	9.892 2682 ⁺ 40385	2 55.4
4	13 35 04.64 ⁺ 13.71	6 45 02.6 ⁺ 101.8	6.05	11.38	.888 2297 ⁺ 40051	2 51.3
5	13 34 50.93 ⁺ 16.67	6 43 20.8 ⁺ 116.8	6.11	11.49	.884 2246 ⁺ 39684	2 47.1
6	13 34 34.26 ⁺ 19.63	6 41 24.0 ⁺ 131.7	6.17	11.59	.880 2562 ⁺ 39281	2 42.9
7	13 34 14.63 ⁺ 22.60	6 39 12.3 ⁺ 146.6	6.22	11.70	.876 3281 ⁺ 38841	2 38.6
8	13 33 52.03 ⁺ 25.57	— 6 36 45.7 ⁺ 161.3	6.28	11.81	9.872 4440 ⁺ 38365	2 34.3
9	13 33 26.46 ⁺ 28.53	6 34 04.4 ⁺ 175.9	6.34	11.91	.868 6075 ⁺ 37855	2 30.0
10	13 32 57.93 ⁺ 31.48	6 31 08.0 ⁺ 190.5	6.39	12.01	.864 8220 ⁺ 37307	2 25.6
11	13 32 26.45 ⁺ 34.42	6 27 58.0 ⁺ 204.9	6.44	12.12	.861 0913 ⁺ 36721	2 21.1
12	13 31 52.03 ⁺ 37.34	6 24 33.1 ⁺ 219.2	6.50	12.22	.857 4192 ⁺ 36099	2 16.6
13	13 31 14.69 ⁺ 40.25	— 6 20 53.9 ⁺ 233.2	6.55	12.32	9.853 8093 ⁺ 35438	2 12.0
14	13 30 34.44 ⁺ 43.12	6 17 00.7 ⁺ 247.1	6.60	12.42	.850 2655 ⁺ 34740	2 07.4
15	13 29 51.32 ⁺ 45.97	6 12 53.6 ⁺ 260.7	6.66	12.52	.846 7915 ⁺ 34002	2 02.8
16	13 29 05.35 ⁺ 48.78	6 08 32.9 ⁺ 274.1	6.71	12.62	.843 3913 ⁺ 33225	1 58.1
17	13 28 16.57 ⁺ 51.54	6 03 58.8 ⁺ 287.2	6.76	12.72	.840 0688 ⁺ 32408	1 53.3
18	13 27 25.03 ⁺ 54.27	— 5 59 11.6 ⁺ 300.1	6.82	12.81	9.836 8280 ⁺ 31551	1 48.5
19	13 26 30.76 ⁺ 56.94	5 54 11.5 ⁺ 312.6	6.87	12.91	.833 6729 ⁺ 30655	1 43.7
20	13 25 33.82 ⁺ 59.54	5 48 58.9 ⁺ 324.7	6.91	13.00	.830 6074 ⁺ 29718	1 38.8
21	13 24 34.28 ⁺ 62.09	5 43 34.2 ⁺ 336.4	6.96	13.09	.827 6356 ⁺ 28741	1 33.9
22	13 23 32.19 ⁺ 64.55	5 37 57.8 ⁺ 347.7	7.01	13.17	.824 7615 ⁺ 27725	1 28.9
23	13 22 27.64 ⁺ 66.96	— 5 32 10.1 ⁺ 358.5	7.05	13.26	9.821 9890 ⁺ 26669	1 23.9
24	13 21 20.68 ⁺ 69.26	5 26 11.6 ⁺ 368.7	7.09	13.34	.819 3221 ⁺ 25573	1 18.9
25	13 20 11.42 ⁺ 71.47	5 20 02.9 ⁺ 378.4	7.14	13.42	.816 7648 ⁺ 24438	1 13.8
26	13 18 59.95 ⁺ 73.58	5 13 44.5 ⁺ 387.5	7.18	13.49	.814 3210 ⁺ 23266	1 08.7
27	13 17 46.37 ⁺ 75.58	5 07 17.0 ⁺ 395.9	7.22	13.57	.811 9944 ⁺ 22057	1 03.5
28	13 16 30.79 ⁺ 77.47	— 5 00 41.1 ⁺ 403.7	7.25	13.64	9.809 7887 ⁺ 20811	0 58.3
29	13 15 13.32 ⁺ 79.23	4 53 57.4 ⁺ 410.5	7.29	13.70	.807 7076 ⁺ 19529	0 53.1
30	13 13 54.09 ⁺ 80.85	4 47 06.9 ⁺ 416.8	7.32	13.76	.805 7547 ⁺ 18213	0 47.9
31	13 12 33.24 ⁺ 82.34	4 40 10.1 ⁺ 422.1	7.35	13.82	.803 9334 ⁺ 16869	0 42.6
Apr. 1	13 11 10.90 ⁺ 83.67	4 33 08.0 ⁺ 426.4	7.38	13.87	.802 2465 ⁺ 15499	0 37.3
2	13 09 47.23 ⁺ 84.84	— 4 26 01.6 ⁺ 429.9	7.40	13.92	9.800 6966 ⁺ 14101	0 32.0
3	13 08 22.39 ⁺	— 4 18 51.7 ⁺	7.43	13.97	9.799 2865 ⁺	0 26.7

(330/3544)

(NAUTICAL ALMANAC, 1935)

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Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Apr. 1	^{h m s} 13 11 10.90	^{° ' "} - 4 33 08.0	7.38	13.87	9.802 2465	^{h m} 0 37.3
2	13 09 47.23	4 26 01.6	7.40	13.92	.800 6966	0 32.0
3	13 08 22.39	4 18 51.7	7.43	13.97	.799 2865	0 26.7
4	13 06 56.54	4 11 39.4	7.46	14.01	.798 0185	0 21.3
5	13 05 29.85	4 04 25.5	7.48	14.05	.796 8939	0 16.0
6	13 04 02.50	3 57 11.2	7.49	14.08	9.795 9138	0 10.6
7	13 02 34.66	3 49 57.3	7.51	14.11	.795 0797	0 05.2
8	13 01 06.49	3 42 44.8	7.52	14.13	.794 3923	23 54.4
9	12 59 38.18	3 35 34.9	7.53	14.15	.793 8513	23 49.0
10	12 58 09.90	3 28 28.3	7.53	14.16	.793 4567	23 43.6
11	12 56 41.82	3 21 26.1	7.54	14.17	9.793 2083	23 38.2
12	12 55 14.10	3 14 29.2	7.54	14.17	.793 1057	23 32.9
13	12 53 46.91	3 07 38.5	7.54	14.17	.793 1472	23 27.5
14	12 52 20.41	3 00 54.8	7.53	14.16	.793 3317	23 22.1
15	12 50 54.77	2 54 19.1	7.53	14.15	.793 6579	23 16.8
16	12 49 30.13	2 47 52.1	7.52	14.14	9.794 1240	23 11.5
17	12 48 06.64	2 41 34.7	7.51	14.12	.794 7276	23 06.2
18	12 46 44.44	2 35 27.6	7.50	14.09	.795 4664	23 00.9
19	12 45 23.68	2 29 31.6	7.48	14.06	.796 3382	22 55.7
20	12 44 04.49	2 23 47.3	7.47	14.03	.797 3403	22 50.5
21	12 42 46.99	2 18 15.4	7.45	14.00	9.798 4696	22 45.3
22	12 41 31.30	2 12 56.6	7.43	13.96	.799 7233	22 40.1
23	12 40 17.55	2 07 51.5	7.40	13.91	.801 0984	22 35.0
24	12 39 05.84	2 03 00.5	7.37	13.86	.802 5919	22 29.9
25	12 37 56.27	1 58 24.3	7.35	13.81	.804 2001	22 24.9
26	12 36 48.96	1 54 03.4	7.32	13.76	9.805 9197	22 19.9
27	12 35 43.99	1 49 58.3	7.29	13.70	.807 7471	22 14.9
28	12 34 41.45	1 46 09.4	7.25	13.64	.809 6786	22 10.0
29	12 33 41.43	1 42 37.1	7.22	13.58	.811 7103	22 05.1
30	12 32 44.01	1 39 21.9	7.19	13.51	.813 8383	22 00.2
May 1	12 31 49.27	1 36 24.0	7.15	13.44	9.816 0587	21 55.4
2	12 30 57.27	1 33 43.7	7.11	13.37	.818 3675	21 50.7
3	12 30 08.06	1 31 21.4	7.07	13.30	.820 7605	21 46.0
4	12 29 21.71	1 29 17.1	7.03	13.22	.823 2333	21 41.3
5	12 28 38.25	1 27 31.1	6.99	13.14	.825 7817	21 36.7
6	12 27 57.73	1 26 03.4	6.95	13.06	9.828 4013	21 32.2
7	12 27 20.16	1 24 54.1	6.90	12.98	.831 0879	21 27.7
8	12 26 45.56	1 24 03.2	6.86	12.90	.833 8374	21 23.2
9	12 26 13.96	1 23 30.7	6.82	12.82	.836 6458	21 18.8
10	12 25 45.35	1 23 16.5	6.77	12.73	.839 5090	21 14.4
11	12 25 19.74	1 23 20.5	6.73	12.65	9.842 4233	21 10.1
12	12 24 57.13	1 23 42.7	6.68	12.56	.845 3851	21 05.8
13	12 24 37.49	1 24 22.8	6.64	12.48	.848 3906	21 01.6
14	12 24 20.83	1 25 20.6	6.59	12.39	.851 4362	20 57.5
15	12 24 07.11	1 26 36.1	6.54	12.30	.854 5190	20 53.4
16	12 23 56.33	1 28 09.0	6.50	12.21	9.857 6356	20 49.3
17	12 23 48.45	1 29 59.1	6.45	12.13	.860 7831	20 45.3

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
	^h ^m ^s	[°] ['] ["]				^h ^m
May 17	12 23 48.45	- 1 29 59.1	6.45	12.13	9.860 7831	20 45.3
18	12 23 43.45	1 32 06.2	6.40	12.04	.863 9583	20 41.3
19	12 23 41.31	1 34 30.0	6.36	11.95	.867 1590	20 37.4
20	12 23 41.98	1 37 10.3	6.31	11.86	.870 3823	20 33.5
21	12 23 45.44	1 40 07.0	6.26	11.77	.873 6258	20 29.7
22	12 23 51.66	1 43 19.6	6.21	11.68	9.876 8871	20 25.9
23	12 24 00.59	1 46 48.1	6.17	11.60	.880 1642	20 22.1
24	12 24 12.22	1 50 32.2	6.12	11.51	.883 4550	20 18.4
25	12 24 26.52	1 54 31.7	6.07	11.42	.886 7574	20 14.8
26	12 24 43.44	1 58 46.4	6.03	11.33	.890 0695	20 11.2
27	12 25 02.96	2 03 16.1	5.99	11.25	9.893 3897	20 07.6
28	12 25 25.05	2 08 00.5	5.94	11.16	.896 7158	20 04.0
29	12 25 49.68	2 12 59.4	5.89	11.08	.900 0461	20 00.5
30	12 26 16.82	2 18 12.6	5.85	10.99	.903 3787	19 57.1
31	12 26 46.42	2 23 39.9	5.81	10.91	.906 7120	19 53.7
June 1	12 27 18.46	2 29 21.0	5.76	10.83	9.910 0442	19 50.3
2	12 27 52.90	2 35 15.7	5.71	10.74	.913 3736	19 47.0
3	12 28 29.70	2 41 23.6	5.67	10.66	.916 6987	19 43.7
4	12 29 08.83	2 47 44.6	5.63	10.58	.920 0181	19 40.5
5	12 29 50.24	2 54 18.4	5.58	10.50	.923 3304	19 37.2
6	12 30 33.89	3 01 04.6	5.54	10.42	9.926 6342	19 34.1
7	12 31 19.75	3 08 03.0	5.50	10.34	.929 9284	19 30.9
8	12 32 07.77	3 15 13.3	5.46	10.26	.933 2120	19 27.8
9	12 32 57.91	3 22 35.2	5.42	10.19	.936 4838	19 24.7
10	12 33 50.12	3 30 08.4	5.38	10.11	.939 7428	19 21.7
11	12 34 44.38	3 37 52.7	5.34	10.03	9.942 9881	19 18.7
12	12 35 40.63	3 45 47.7	5.30	9.96	.946 2190	19 15.7
13	12 36 38.85	3 53 53.3	5.26	9.89	.949 4349	19 12.8
14	12 37 38.98	4 02 09.0	5.22	9.81	.952 6350	19 09.9
15	12 38 40.99	4 10 34.7	5.18	9.74	.955 8187	19 07.0
16	12 39 44.84	4 19 10.0	5.15	9.67	9.958 9857	19 04.1
17	12 40 50.50	4 27 54.7	5.11	9.60	.962 1357	19 01.3
18	12 41 57.94	4 36 48.7	5.07	9.53	.965 2683	18 58.5
19	12 43 07.11	4 45 51.5	5.03	9.46	.968 3833	18 55.8
20	12 44 18.00	4 55 03.1	5.00	9.40	.971 4803	18 53.0
21	12 45 30.57	5 04 23.3	4.97	9.33	9.974 5593	18 50.3
22	12 46 44.80	5 13 51.7	4.93	9.27	.977 6199	18 47.7
23	12 48 00.67	5 23 28.3	4.89	9.20	.980 6619	18 45.0
24	12 49 18.14	5 33 12.8	4.86	9.14	.983 6852	18 42.4
25	12 50 37.20	5 43 05.1	4.83	9.07	.986 6894	18 39.8
26	12 51 57.82	5 53 05.0	4.80	9.01	9.989 6744	18 37.2
27	12 53 20.00	6 03 12.2	4.76	8.95	.992 6400	18 34.7
28	12 54 43.71	6 13 26.7	4.73	8.89	.995 5858	18 32.1
29	12 56 08.92	6 23 48.2	4.70	8.83	9.998 5116	18 29.6
30	12 57 35.61	6 34 16.4	4.67	8.77	0.001 4171	18 27.2
July 1	12 59 03.77	6 44 51.2	4.64	8.71	0.004 3019	18 24.7
2	13 00 33.37	6 55 32.4	4.61	8.66	0.007 1658	18 22.3

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
July	^{h m s}	^{° ' "}	^{' "}	^{' "}		^{h m}
1	12 59 03.77 + 89.60	- 6 44 51.2 - 641.2	4.64	8.71	0.004 3019 + 28639	18 24.7
2	13 00 33.37 91.02	6 55 32.4 647.3	4.61	8.66	0.007 1658 28429	18 22.3
3	13 02 04.39 92.42	7 06 19.7 653.3	4.57	8.60	0.010 0087 28217	18 19.9
4	13 03 36.81 93.80	7 17 13.0 659.0	4.54	8.54	0.012 8304 28003	18 17.5
5	13 05 10.61 95.15	7 28 12.0 664.4	4.52	8.49	0.015 6307 27788	18 15.1
6	13 06 45.76 + 96.48	- 7 39 16.4 - 669.8	4.49	8.43	0.018 4095 + 27574	18 12.8
7	13 08 22.24 97.80	7 50 26.2 674.8	4.46	8.38	0.021 1669 27357	18 10.5
8	13 10 00.04 99.10	8 01 41.0 679.6	4.43	8.33	0.023 9026 27140	18 08.2
9	13 11 39.14 100.37	8 13 00.6 684.3	4.40	8.28	0.026 6166 26925	18 05.9
10	13 13 19.51 101.62	8 24 24.9 688.7	4.37	8.22	0.029 3091 26709	18 03.7
11	13 15 01.13 + 102.86	- 8 35 53.6 - 692.9	4.35	8.17	0.031 9800 + 26493	18 01.4
12	13 16 43.99 104.08	8 47 26.5 696.9	4.32	8.12	0.034 6293 26278	17 59.2
13	13 18 28.07 105.28	8 59 03.4 700.6	4.30	8.08	0.037 2571 26066	17 57.0
14	13 20 13.35 106.45	9 10 44.0 704.2	4.27	8.03	0.039 8637 25856	17 54.9
15	13 21 59.80 107.63	9 22 28.2 707.6	4.24	7.98	0.042 4493 25647	17 52.7
16	13 23 47.43 + 108.78	- 9 34 15.8 - 710.8	4.22	7.93	0.045 0140 + 25441	17 50.6
17	13 25 36.21 109.92	9 46 06.6 713.8	4.20	7.89	0.047 5581 25238	17 48.5
18	13 27 26.13 111.06	9 58 00.4 716.6	4.17	7.84	0.050 0819 25037	17 46.4
19	13 29 17.19 112.18	10 09 57.0 719.3	4.15	7.80	0.052 5856 24838	17 44.3
20	13 31 09.37 113.30	10 21 56.3 721.8	4.12	7.75	0.055 0694 24641	17 42.2
21	13 33 02.67 + 114.41	- 10 33 58.1 - 724.2	4.10	7.71	0.057 5335 + 24446	17 40.2
22	13 34 57.08 115.51	10 46 02.3 726.3	4.08	7.67	0.059 9781 24252	17 38.2
23	13 36 52.59 116.61	10 58 08.6 728.3	4.05	7.62	0.062 4033 24060	17 36.2
24	13 38 49.20 117.71	11 10 16.9 730.2	4.03	7.58	0.064 8093 23869	17 34.2
25	13 40 46.91 118.80	11 22 27.1 731.9	4.01	7.54	0.067 1962 23678	17 32.2
26	13 42 45.71 + 119.88	- 11 34 39.0 - 733.4	3.99	7.50	0.069 5640 + 23488	17 30.3
27	13 44 45.59 120.96	11 46 52.4 734.6	3.97	7.46	0.071 9128 23298	17 28.4
28	13 46 46.55 122.03	11 59 07.0 735.8	3.95	7.42	0.074 2426 23108	17 26.5
29	13 48 48.58 123.10	12 11 22.8 736.8	3.93	7.38	0.076 5534 22919	17 24.6
30	13 50 51.68 124.15	12 23 39.6 737.5	3.90	7.34	0.078 8453 22729	17 22.7
31	13 52 55.83 + 125.20	- 12 35 57.1 - 738.0	3.88	7.30	0.081 1182 + 22542	17 20.8
Aug. 1	13 55 01.03 126.25	12 48 15.1 738.4	3.86	7.26	0.083 3724 22354	17 19.0
2	13 57 07.28 127.29	13 00 33.5 738.6	3.84	7.22	0.085 6078 22167	17 17.2
3	13 59 14.57 128.31	13 12 52.1 738.5	3.83	7.19	0.087 8245 21982	17 15.4
4	14 01 22.88 129.33	13 25 10.6 738.2	3.81	7.15	0.090 0227 21797	17 13.6
5	14 03 32.21 + 130.35	- 13 37 28.8 - 737.7	3.79	7.12	0.092 2024 + 21614	17 11.8
6	14 05 42.56 131.36	13 49 46.5 737.1	3.77	7.08	0.094 3638 21431	17 10.0
7	14 07 53.92 132.35	14 02 03.6 736.2	3.75	7.05	0.096 5069 21252	17 08.3
8	14 10 06.27 133.35	14 14 19.8 735.1	3.73	7.01	0.098 6321 21072	17 06.6
9	14 12 19.62 134.33	14 26 34.9 733.8	3.71	6.98	0.100 7393 20896	17 04.9
10	14 14 33.95 + 135.30	- 14 38 48.7 - 732.4	3.69	6.94	0.102 8289 + 20721	17 03.2
11	14 16 49.25 136.27	14 51 01.1 730.6	3.68	6.91	0.104 9010 20550	17 01.5
12	14 19 05.52 137.23	15 03 11.7 728.7	3.66	6.88	0.106 9560 20380	16 59.8
13	14 21 22.75 138.19	15 15 20.4 726.6	3.65	6.85	0.108 9940 20214	16 58.2
14	14 23 40.94 139.15	15 27 27.0 724.4	3.63	6.81	0.111 0154 20051	16 56.6
15	14 26 00.09 + 140.10	- 15 39 31.4 - 721.9	3.61	6.78	0.113 0205 + 19890	16 55.0
16	14 28 20.19 141.00	15 51 33.3 719.9	3.59	6.75	0.115 0095 19729	16 53.4

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Aug. 16	^{h m s} 14 28 20.19	^{° ' "} -15 51 33.3	3.59	6.75	0.115 0095	^{h m} 16 53.4
17	14 30 41.24	16 03 32.5	3.57	6.72	0.116 9828	16 51.8
18	14 33 03.24	16 15 29.0	3.56	6.69	0.118 9407	16 50.2
19	14 35 26.19	16 27 22.4	3.54	6.66	0.120 8834	16 48.7
20	14 37 50.09	16 39 12.6	3.53	6.63	0.122 8110	16 47.2
21	14 40 14.94	16 50 59.5	3.51	6.60	0.124 7239	16 45.7
22	14 42 40.74	17 02 42.8	3.50	6.57	0.126 6221	16 44.2
23	14 45 07.50	17 14 22.4	3.48	6.54	0.128 5057	16 42.7
24	14 47 35.22	17 25 58.1	3.47	6.52	0.130 3747	16 41.2
25	14 50 03.89	17 37 29.6	3.45	6.49	0.132 2294	16 39.7
26	14 52 33.51	17 48 56.7	3.44	6.46	0.134 0698	16 38.3
27	14 55 04.08	18 00 19.4	3.42	6.44	0.135 8959	16 36.9
28	14 57 35.60	18 11 37.3	3.41	6.41	0.137 7078	16 35.5
29	15 00 08.07	18 22 50.2	3.39	6.38	0.139 5057	16 34.1
30	15 02 41.47	18 33 57.9	3.38	6.36	0.141 2896	16 32.7
31	15 05 15.81	18 45 00.3	3.37	6.33	0.143 0596	16 31.4
Sept. 1	15 07 51.08	18 55 57.0	3.35	6.30	0.144 8157	16 30.0
2	15 10 27.28	19 06 48.0	3.34	6.28	0.146 5582	16 28.7
3	15 13 04.41	19 17 32.9	3.33	6.25	0.148 2872	16 27.4
4	15 15 42.45	19 28 11.5	3.32	6.23	0.150 0027	16 26.1
5	15 18 21.40	19 38 43.7	3.30	6.20	0.151 7050	16 24.8
6	15 21 01.25	19 49 09.2	3.29	6.18	0.153 3941	16 23.5
7	15 23 42.01	19 59 27.8	3.28	6.16	0.155 0701	16 22.3
8	15 26 23.65	20 09 39.3	3.26	6.13	0.156 7334	16 21.0
9	15 29 06.18	20 19 43.5	3.25	6.11	0.158 3841	16 19.8
10	15 31 49.58	20 29 40.2	3.24	6.09	0.160 0224	16 18.6
11	15 34 33.85	20 39 29.1	3.22	6.06	0.161 6488	16 17.4
12	15 37 18.99	20 49 10.0	3.21	6.04	0.163 2633	16 16.2
13	15 40 04.99	20 58 42.9	3.20	6.02	0.164 8663	16 15.1
14	15 42 51.84	21 08 07.4	3.19	6.00	0.166 4581	16 13.9
15	15 45 39.55	21 17 23.3	3.18	5.98	0.168 0388	16 12.8
16	15 48 28.11	21 26 30.5	3.17	5.95	0.169 6088	16 11.7
17	15 51 17.52	21 35 28.8	3.16	5.93	0.171 1682	16 10.6
18	15 54 07.78	21 44 17.9	3.15	5.91	0.172 7172	16 09.5
19	15 56 58.87	21 52 57.7	3.13	5.89	0.174 2559	16 08.4
20	15 59 50.81	22 01 28.0	3.12	5.87	0.175 7845	16 07.3
21	16 02 43.59	22 09 48.6	3.11	5.85	0.177 3030	16 06.2
22	16 05 37.20	22 17 59.2	3.10	5.83	0.178 8115	16 05.2
23	16 08 31.63	22 25 59.7	3.09	5.81	0.180 3102	16 04.2
24	16 11 26.89	22 33 49.9	3.08	5.79	0.181 7990	16 03.2
25	16 14 22.95	22 41 29.5	3.07	5.77	0.183 2781	16 02.2
26	16 17 19.82	22 48 58.4	3.06	5.75	0.184 7474	16 01.2
27	16 20 17.49	22 56 16.4	3.05	5.73	0.186 2072	16 00.2
28	16 23 15.94	23 03 23.3	3.04	5.71	0.187 6573	15 59.3
29	16 26 15.17	23 10 18.8	3.03	5.69	0.189 0980	15 58.3
30	16 29 15.16	23 17 02.8	3.02	5.67	0.190 5292	15 57.4
Oct. 1	16 32 15.91	23 23 35.1	3.01	5.66	0.191 9511	15 56.5

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Oct. 1	^{h m s} 16 32 15.91 +181.48	^{° ' "} -23 23 35.1 -380.4	3.01	5.66	0.191 9511	^{h m} 15 56.5
2	16 35 17.39 +182.21	23 29 55.5 368.3	3.00	5.64	.193 3637 +14126	15 55.6
3	16 38 19.60 +182.92	23 36 03.8 356.0	2.99	5.62	.194 7672 14035	15 54.7
4	16 41 22.52 +183.62	23 41 59.8 343.6	2.98	5.60	.196 1616 13944	15 53.8
5	16 44 26.14 +184.30	23 47 43.4 330.9	2.97	5.58	.197 5471 13855	15 52.9
6	16 47 30.44 +184.97	-23 53 14.3 -318.1	2.96	5.57	0.198 9239 +13682	15 52.0
7	16 50 35.41 +185.63	23 58 32.4 305.1	2.95	5.55	.200 2921 13597	15 51.2
8	16 53 41.04 +186.26	24 03 37.5 291.9	2.94	5.53	.201 6518 13515	15 50.4
9	16 56 47.30 +186.89	24 08 29.4 278.7	2.93	5.51	.203 0033 13436	15 49.5
10	16 59 54.19 +187.50	24 13 08.1 265.2	2.92	5.50	.204 3469 13357	15 48.7
11	17 03 01.69 +188.09	-24 17 33.3 -251.6	2.91	5.48	0.205 6826 +13283	15 47.9
12	17 06 09.78 +188.68	24 21 44.9 237.9	2.90	5.46	.207 0109 13209	15 47.1
13	17 09 18.46 +189.25	24 25 42.8 224.0	2.90	5.45	.208 3318 13137	15 46.3
14	17 12 27.71 +189.81	24 29 26.8 209.9	2.89	5.43	.209 6455 13069	15 45.5
15	17 15 37.52 +190.35	24 32 56.7 195.7	2.88	5.41	.210 9524 13000	15 44.7
16	17 18 47.87 +190.89	-24 36 12.4 -181.4	2.87	5.40	0.212 2524 +12934	15 44.0
17	17 21 58.76 +191.42	24 39 13.8 166.9	2.86	5.38	.213 5458 12868	15 43.2
18	17 25 10.18 +191.93	24 42 00.7 152.4	2.86	5.37	.214 8326 12804	15 42.5
19	17 28 22.11 +192.43	24 44 33.1 137.6	2.85	5.35	.216 1130 12739	15 41.7
20	17 31 34.54 +192.90	24 46 50.7 122.8	2.84	5.33	.217 3869 12676	15 41.0
21	17 34 47.44 +193.37	-24 48 53.5 -107.8	2.83	5.32	0.218 6545 +12612	15 40.3
22	17 38 00.81 +193.82	24 50 41.3 92.8	2.82	5.30	.219 9157 12549	15 39.6
23	17 41 14.63 +194.25	24 52 14.1 77.5	2.82	5.29	.221 1706 12487	15 38.9
24	17 44 28.88 +194.67	24 53 31.6 62.3	2.81	5.27	.222 4193 12426	15 38.2
25	17 47 43.55 +195.06	24 54 33.9 46.9	2.80	5.26	.223 6619 12365	15 37.5
26	17 50 58.61 +195.45	-24 55 20.8 -31.4	2.79	5.24	0.224 8984 +12303	15 36.8
27	17 54 14.06 +195.81	24 55 52.2 15.8	2.79	5.23	.226 1287 12242	15 36.1
28	17 57 29.87 +196.15	24 56 08.0 0.1	2.78	5.21	.227 3529 12182	15 35.4
29	18 00 46.02 +196.47	24 56 08.1 15.5	2.77	5.20	.228 5711 12122	15 34.7
30	18 04 02.49 +196.77	24 55 52.6 31.4	2.76	5.18	.229 7833 12062	15 34.1
31	18 07 19.26 +197.06	-24 55 21.2 +47.1	2.75	5.17	0.230 9895 +12003	15 33.4
Nov. 1	18 10 36.32 +197.31	24 54 34.1 63.1	2.75	5.16	.232 1898 11945	15 32.8
2	18 13 53.63 +197.54	24 53 31.0 79.1	2.74	5.14	.233 3843 11887	15 32.1
3	18 17 11.17 +197.76	24 52 11.9 95.0	2.73	5.13	.234 5730 11832	15 31.5
4	18 20 28.93 +197.96	24 50 36.9 111.0	2.72	5.11	.235 7562 11777	15 30.8
5	18 23 46.89 +198.12	-24 48 45.9 +127.0	2.71	5.10	0.236 9339 +11723	15 30.2
6	18 27 05.01 +198.28	24 46 38.9 143.2	2.70	5.08	.238 1062 11673	15 29.6
7	18 30 23.29 +198.41	24 44 15.7 159.2	2.70	5.07	.239 2735 11622	15 28.9
8	18 33 41.70 +198.53	24 41 36.5 175.3	2.69	5.06	.240 4357 11574	15 28.3
9	18 37 00.23 +198.62	24 38 41.2 191.4	2.69	5.05	.241 5931 11528	15 27.6
10	18 40 18.85 +198.70	-24 35 29.8 +207.5	2.68	5.03	0.242 7459 +11483	15 27.0
11	18 43 37.55 +198.76	24 32 02.3 223.6	2.67	5.02	.243 8942 11440	15 26.4
12	18 46 56.31 +198.80	24 28 18.7 239.8	2.66	5.00	.245 0382 11397	15 25.8
13	18 50 15.11 +198.84	24 24 18.9 255.8	2.66	4.99	.246 1779 11356	15 25.1
14	18 53 33.95 +198.86	24 20 03.1 271.9	2.65	4.98	.247 3135 11316	15 24.5
15	18 56 52.81 +198.85	-24 15 31.2 +288.0	2.65	4.97	0.248 4451 +11277	15 23.9
16	19 00 11.66 +198.85	-24 10 43.2	2.64	4.95	0.249 5728	15 23.3

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Nov. 16	^{h m s} 19 00 11.66 +198.84	^{° ' "} -24 10 43.2 +304.1	2.64	4.95	0.249 5728 +11238	^{h m} 15 23.3
17	19 03 30.50 198.81	24 05 39.1 320.0	2.63	4.94	.250 6966 11199	15 22.6
18	19 06 49.31 198.76	24 00 19.1 336.1	2.63	4.93	.251 8165 11161	15 22.0
19	19 10 08.07 198.70	23 54 43.0 351.9	2.62	4.91	.252 9326 11122	15 21.4
20	19 13 26.77 198.62	23 48 51.1 367.8	2.61	4.90	.254 0448 11085	15 20.7
21	19 16 45.39 +198.53	-23 42 43.3 +383.7	2.60	4.89	0.255 1533 +11047	15 20.1
22	19 20 03.92 198.42	23 36 19.6 399.4	2.60	4.88	.256 2580 11008	15 19.4
23	19 23 22.34 198.30	23 29 40.2 415.0	2.59	4.86	.257 3588 10970	15 18.8
24	19 26 40.64 198.16	23 22 45.2 430.7	2.58	4.85	.258 4558 10932	15 18.2
25	19 29 58.80 198.00	23 15 34.5 446.2	2.57	4.84	.259 5490 10893	15 17.5
26	19 33 16.80 +197.83	-23 08 08.3 +461.7	2.57	4.83	0.260 6383 +10855	15 16.9
27	19 36 34.63 197.63	23 00 26.6 477.0	2.56	4.82	.261 7238 10817	15 16.2
28	19 39 52.26 197.43	22 52 29.6 492.2	2.55	4.80	.262 8055 10780	15 15.6
29	19 43 09.69 197.20	22 44 17.4 507.3	2.55	4.79	.263 8835 10741	15 14.9
30	19 46 26.89 196.97	22 35 50.1 522.4	2.54	4.78	.264 9576 10704	15 14.3
Dec. 1	19 49 43.86 +196.72	-22 27 07.7 +537.2	2.54	4.77	0.266 0280 +10667	15 13.6
2	19 53 00.58 196.44	22 18 10.5 551.9	2.53	4.76	.267 0947 10632	15 13.0
3	19 56 17.02 196.16	22 08 58.6 566.6	2.53	4.75	.268 1579 10596	15 12.3
4	19 59 33.18 195.87	21 59 32.0 581.0	2.52	4.73	.269 2175 10561	15 11.6
5	20 02 49.05 195.56	21 49 51.0 595.3	2.51	4.72	.270 2736 10529	15 10.9
6	20 06 04.61 +195.24	-21 39 55.7 +609.5	2.51	4.71	0.271 3265 +10497	15 10.2
7	20 09 19.85 194.90	21 29 46.2 623.6	2.50	4.70	.272 3762 10467	15 09.5
8	20 12 34.75 194.57	21 19 22.6 637.5	2.50	4.69	.273 4229 10437	15 08.8
9	20 15 49.32 194.22	21 08 45.1 651.3	2.49	4.68	.274 4666 10409	15 08.1
10	20 19 03.54 193.86	20 57 53.8 664.9	2.49	4.67	.275 5075 10381	15 07.4
11	20 22 17.40 +193.49	-20 46 48.9 +678.4	2.48	4.65	0.276 5456 +10355	15 06.7
12	20 25 30.89 193.13	20 35 30.5 691.7	2.47	4.64	.277 5811 10329	15 06.0
13	20 28 44.02 192.75	20 23 58.8 704.9	2.47	4.63	.278 6140 10303	15 05.3
14	20 31 56.77 192.37	20 12 13.9 718.0	2.46	4.62	.279 6443 10279	15 04.6
15	20 35 09.14 191.98	20 00 15.9 730.8	2.46	4.61	.280 6722 10254	15 03.8
16	20 38 21.12 +191.60	-19 48 05.1 +743.5	2.45	4.60	0.281 6976 +10230	15 03.1
17	20 41 32.72 191.20	19 35 41.6 756.1	2.44	4.59	.282 7206 10204	15 02.3
18	20 44 43.92 190.80	19 23 05.5 768.4	2.44	4.58	.283 7410 10180	15 01.5
19	20 47 54.72 190.40	19 10 17.1 780.6	2.43	4.57	.284 7590 10154	15 00.8
20	20 51 05.12 189.99	18 57 16.5 792.6	2.43	4.56	.285 7744 10127	15 00.0
21	20 54 15.11 +189.58	-18 44 03.9 +804.5	2.42	4.55	0.286 7871 +10102	14 59.2
22	20 57 24.69 189.16	18 30 39.4 816.1	2.41	4.54	.287 7973 10075	14 58.4
23	21 00 33.85 188.75	18 17 03.3 827.6	2.40	4.52	.288 8048 10048	14 57.6
24	21 03 42.60 188.33	18 03 15.7 838.8	2.40	4.51	.289 8096 10021	14 56.8
25	21 06 50.93 187.90	17 49 16.9 849.9	2.39	4.50	.290 8117 9994	14 56.0
26	21 09 58.83 +187.47	-17 35 07.0 +860.8	2.39	4.49	0.291 8111 +9965	14 55.2
27	21 13 06.30 187.03	17 20 46.2 871.4	2.38	4.48	.292 8076 9937	14 54.4
28	21 16 13.33 186.60	17 06 14.8 881.9	2.38	4.47	.293 8013 9907	14 53.6
29	21 19 19.93 186.15	16 51 32.9 892.1	2.37	4.46	.294 7920 9880	14 52.7
30	21 22 26.08 185.71	16 36 40.8 902.1	2.37	4.45	.295 7800 9851	14 51.9
31	21 25 31.79 +185.27	-16 21 38.7 +911.8	2.36	4.44	0.296 7651 +9823	14 51.0
32	21 28 37.06	-16 06 26.9	2.36	4.43	0.297 7474	14 50.2

JUPITER, 1935

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Jan. 1	^{h m s} 14 58 45.02	^{° ' "} -15 52 32.1	15.40	1.47	0.775 9082	^{h m} 8 18.7
2	14 59 25.72 +40.70	15 55 19.4 -167.3	15.43	1.48	.774 9529 9553	8 15.5
3	15 00 06.06 40.34	15 58 04.5 165.1	15.47	1.48	.773 9853 9676	8 12.2
4	15 00 46.03 39.97	16 00 47.3 162.8	15.50	1.48	.773 0053 9800	8 09.0
5	15 01 25.61 39.58	16 03 27.8 160.5	15.54	1.49	.772 0131 9922	8 05.7
6	15 02 04.80 39.19	16 06 06.0 158.2	15.57	1.49	0.771 0090 10041	8 02.4
7	15 02 43.60 +38.80	16 08 41.8 -155.8	15.61	1.49	.769 9929 -10161	7 59.1
8	15 03 21.99 38.39	16 11 15.4 153.6	15.65	1.50	.768 9650 10279	7 55.8
9	15 03 59.97 37.98	16 13 46.6 151.2	15.68	1.50	.767 9256 10394	7 52.5
10	15 04 37.53 37.56	16 16 15.5 148.9	15.72	1.51	.766 8748 10508	7 49.2
11	15 05 14.66 37.13	16 18 42.0 146.5	15.76	1.51	0.765 8127 10621	7 45.9
12	15 05 51.35 +36.69	16 21 06.1 -144.1	15.80	1.51	.764 7394 -10733	7 42.6
13	15 06 27.60 36.25	16 23 27.7 141.6	15.84	1.52	.763 6553 10841	7 39.2
14	15 07 03.40 35.80	16 25 47.0 139.3	15.88	1.52	.762 5604 10949	7 35.9
15	15 07 38.75 35.35	16 28 03.9 136.9	15.92	1.52	.761 4548 11056	7 32.5
16	15 08 13.64 34.89	16 30 18.4 134.5	15.96	1.53	0.760 3388 11160	7 29.2
17	15 08 48.05 +34.41	16 32 30.4 -132.0	16.00	1.53	.759 2125 -11263	7 25.8
18	15 09 21.99 33.94	16 34 40.0 129.6	16.04	1.54	.758 0761 11364	7 22.4
19	15 09 55.45 33.46	16 36 47.2 127.2	16.09	1.54	.756 9297 11464	7 19.0
20	15 10 28.41 32.96	16 38 51.8 124.6	16.13	1.54	.755 7734 11563	7 15.7
21	15 11 00.88 32.47	16 40 54.0 122.2	16.17	1.55	0.754 6075 11659	7 12.3
22	15 11 32.84 +31.96	16 42 53.7 -119.7	16.22	1.55	.753 4320 -11755	7 08.9
23	15 12 04.29 31.45	16 44 50.9 117.2	16.26	1.56	.752 2472 11848	7 05.5
24	15 12 35.22 30.93	16 46 45.6 114.7	16.31	1.56	.751 0532 11940	7 02.0
25	15 13 05.62 30.40	16 48 37.8 112.2	16.35	1.57	.749 8503 12029	6 58.6
26	15 13 35.49 29.87	16 50 27.5 109.7	16.40	1.57	0.748 6387 12116	6 55.2
27	15 14 04.81 +29.32	16 52 14.6 -107.1	16.44	1.57	.747 4185 -12202	6 51.7
28	15 14 33.57 28.76	16 53 59.2 104.6	16.49	1.58	.746 1899 12286	6 48.3
29	15 15 01.78 28.21	16 55 41.1 101.9	16.54	1.58	.744 9531 12368	6 44.8
30	15 15 29.42 27.64	16 57 20.5 99.4	16.58	1.59	.743 7083 12448	6 41.3
31	15 15 56.48 27.06	16 58 57.2 96.7	16.63	1.59	0.742 4558 12525	6 37.8
Feb. 1	15 16 22.95 +26.47	17 00 31.4 -94.2	16.68	1.60	.741 1957 -12601	6 34.3
2	15 16 48.83 25.88	17 02 02.9 91.5	16.73	1.60	.739 9283 12674	6 30.8
3	15 17 14.11 25.28	17 03 31.7 88.8	16.78	1.61	.738 6540 12743	6 27.3
4	15 17 38.77 24.66	17 04 57.9 86.2	16.83	1.61	.737 3731 12809	6 23.8
5	15 18 02.82 24.05	17 06 21.4 83.5	16.88	1.62	0.736 0860 12871	6 20.3
6	15 18 26.24 +23.42	17 07 42.3 -80.9	16.93	1.62	.734 7928 -12932	6 16.7
7	15 18 49.03 22.79	17 09 00.5 78.2	16.98	1.63	.733 4940 12988	6 13.1
8	15 19 11.18 22.15	17 10 16.0 75.5	17.03	1.63	.732 1898 13042	6 09.6
9	15 19 32.68 21.50	17 11 28.8 72.8	17.08	1.64	.730 8804 13094	6 06.0
10	15 19 53.54 20.86	17 12 38.9 70.1	17.13	1.64	0.729 5661 13143	6 02.4
11	15 20 13.74 +20.20	17 13 46.4 -67.5	17.18	1.65	.728 2474 -13187	5 58.8
12	15 20 33.29 19.55	17 14 51.1 64.7	17.24	1.65	.726 9245 13229	5 55.2
13	15 20 52.17 18.88	17 15 53.2 62.1	17.29	1.66	.725 5977 13268	5 51.6
14	15 21 10.37 18.20	17 16 52.6 59.4	17.34	1.66	.724 2674 13303	5 47.9
15	15 21 27.90 17.53	17 17 49.3 56.7	17.40	1.67	0.722 9338 13336	5 44.3
16	15 21 44.75 +16.85	17 18 43.3 -54.0	17.45	1.67	0.721 5974 -13364	5 40.6

JUPITER, 1935

209

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Feb. 16	^{h m s} 15 21 44.75 +16.15	^{° ′ ″} -17 18 43.3 - 51.3	17.45	1.67	0.721 5974 -13392	^{h m} 5 40.6
17	15 22 00.90 15.47	17 19 34.6 - 48.5	17.50	1.68	.720 2582 13414	5 37.0
18	15 22 16.37 14.76	17 20 23.1 - 45.8	17.56	1.68	.718 9168 13434	5 33.3
19	15 22 31.13 14.07	17 21 08.9 - 43.1	17.61	1.69	.717 5734 13450	5 29.6
20	15 22 45.20 13.35	17 21 52.0 - 40.3	17.67	1.69	.716 2284 13463	5 25.9
21	15 22 58.55 +12.64	-17 22 32.3 - 37.6	17.72	1.70	0.714 8821 -13472	5 22.2
22	15 23 11.19 11.92	17 23 09.9 - 34.8	17.78	1.70	.713 5349 13477	5 18.5
23	15 23 23.11 11.19	17 23 44.7 - 32.0	17.83	1.71	.712 1872 13480	5 14.7
24	15 23 34.30 10.46	17 24 16.7 - 29.3	17.89	1.71	.710 8392 13477	5 11.0
25	15 23 44.76 9.72	17 24 46.0 - 26.5	17.94	1.72	.709 4915 13472	5 07.2
26	15 23 54.48 + 8.99	-17 25 12.5 - 23.7	18.00	1.72	0.708 1443 -13462	5 03.5
27	15 24 03.47 8.23	17 25 36.2 - 21.0	18.05	1.73	.706 7981 13448	4 59.7
28	15 24 11.70 7.49	17 25 57.2 - 18.1	18.11	1.73	.705 4533 13430	4 55.9
Mar. 1	15 24 19.19 6.74	17 26 15.3 - 15.4	18.17	1.74	.704 1103 13407	4 52.1
2	15 24 25.93 5.98	17 26 30.7 - 12.6	18.22	1.74	.702 7696 13380	4 48.2
3	15 24 31.91 + 5.22	-17 26 43.3 - 9.7	18.28	1.75	0.701 4316 -13348	4 44.4
4	15 24 37.13 4.45	17 26 53.0 - 7.0	18.33	1.76	.700 0968 13311	4 40.5
5	15 24 41.58 3.70	17 27 00.0 - 4.2	18.39	1.76	.698 7657 13269	4 36.7
6	15 24 45.28 2.92	17 27 04.2 - 1.4	18.45	1.77	.697 4388 13222	4 32.8
7	15 24 48.20 2.16	17 27 05.6 + 1.4	18.50	1.77	.696 1166 13170	4 28.9
8	15 24 50.36 + 1.39	-17 27 04.2 + 4.1	18.56	1.78	0.694 7996 -13113	4 25.0
9	15 24 51.75 + 0.62	17 27 00.1 + 6.9	18.62	1.78	.693 4883 13051	4 21.1
10	15 24 52.37 - 0.14	17 26 53.2 - 9.7	18.67	1.79	.692 1832 12985	4 17.2
11	15 24 52.23 - 0.91	17 26 43.5 - 12.4	18.73	1.79	.690 8847 12913	4 13.3
12	15 24 51.32 1.67	17 26 31.1 - 15.1	18.78	1.80	.689 5934 12838	4 09.3
13	15 24 49.65 - 2.43	-17 26 16.0 + 17.9	18.84	1.80	0.688 3096 -12757	4 05.4
14	15 24 47.22 3.20	17 25 58.1 + 20.6	18.89	1.81	.687 0339 12672	4 01.4
15	15 24 44.02 3.95	17 25 37.5 - 23.3	18.95	1.81	.685 7667 12582	3 57.4
16	15 24 40.07 4.71	17 25 14.2 - 26.1	19.00	1.82	.684 5085 12487	3 53.4
17	15 24 35.36 5.46	17 24 48.1 - 28.7	19.06	1.82	.683 2598 12388	3 49.4
18	15 24 29.90 - 6.22	-17 24 19.4 + 31.4	19.11	1.83	0.682 0210 -12283	3 45.4
19	15 24 23.68 6.97	17 23 48.0 + 34.1	19.17	1.84	.680 7927 12173	3 41.3
20	15 24 16.71 7.71	17 23 13.9 - 36.7	19.22	1.84	.679 5754 12059	3 37.3
21	15 24 09.00 8.45	17 22 37.2 - 39.4	19.28	1.85	.678 3695 11940	3 33.2
22	15 24 00.55 9.19	17 21 57.8 - 42.1	19.33	1.85	.677 1755 11816	3 29.1
23	15 23 51.36 - 9.92	-17 21 15.7 + 44.7	19.38	1.86	0.675 9939 -11687	3 25.0
24	15 23 41.44 10.66	17 20 31.0 + 47.3	19.43	1.86	.674 8252 11552	3 20.9
25	15 23 30.78 11.38	17 19 43.7 - 49.9	19.48	1.87	.673 6700 11413	3 16.8
26	15 23 19.40 12.09	17 18 53.8 - 52.5	19.54	1.87	.672 5287 11268	3 12.7
27	15 23 07.31 12.82	17 18 01.3 - 55.0	19.59	1.87	.671 4019 11117	3 08.6
28	15 22 54.49 -13.52	-17 17 06.3 + 57.6	19.64	1.88	0.670 2902 -10962	3 04.4
29	15 22 40.97 14.23	17 16 08.7 + 60.1	19.69	1.88	.669 1940 10801	3 00.3
30	15 22 26.74 14.92	17 15 08.6 - 62.7	19.74	1.89	.668 1139 10635	2 56.1
31	15 22 11.82 15.60	17 14 05.9 - 65.0	19.78	1.89	.667 0504 10462	2 51.9
Apr. 1	15 21 56.22 16.28	17 13 00.9 - 67.5	19.83	1.90	.666 0042 10285	2 47.7
2	15 21 39.94 -16.95	-17 11 53.4 + 70.0	19.88	1.90	0.664 9757 -10101	2 43.5
3	15 21 22.99	-17 10 43.4	19.93	1.91	0.663 9656	2 39.3

JUPITER, 1935

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Apr. 1	^{h m s} 15 21 56.22 -16.28	^{° ' "} -17 13 00.9 + 67.5	19.83	1.90	0.666 0042	^{h m} 2 47.7
2	15 21 39.94 16.95	17 11 53.4 70.0	19.88	1.90	.664 9757 -10285	2 43.5
3	15 21 22.99 17.61	17 10 43.4 72.3	19.93	1.91	.663 9656 10101	2 39.3
4	15 21 05.38 18.25	17 09 31.1 74.6	19.97	1.91	.662 9742 9914	2 35.1
5	15 20 47.13 18.88	17 08 16.5 77.0	20.02	1.92	.662 0023 9521	2 30.9
6	15 20 28.25 19.50	-17 06 59.5 79.2	20.06	1.92	0.661 0502	2 26.6
7	15 20 08.75 20.11	17 05 40.3 81.4	20.10	1.92	.660 1185 -9317	2 22.4
8	15 19 48.64 20.70	17 04 18.9 83.5	20.14	1.93	.659 2076 9109	2 18.1
9	15 19 27.94 21.28	17 02 55.4 85.7	20.19	1.93	.658 3181 8895	2 13.8
10	15 19 06.66 21.84	17 01 29.7 87.7	20.23	1.94	.657 4504 8677	2 09.5
11	15 18 44.82 22.39	-17 00 02.0 89.8	20.27	1.94	0.656 6050 -8228	2 05.2
12	15 18 22.43 22.93	16 58 32.2 91.7	20.30	1.94	.655 7822 7998	2 00.9
13	15 17 59.50 23.45	16 57 00.5 93.7	20.34	1.95	.654 9824 7763	1 56.6
14	15 17 36.05 23.95	16 55 26.8 95.6	20.38	1.95	.654 2061 7525	1 52.3
15	15 17 12.10 24.44	16 53 51.2 97.4	20.41	1.95	.653 4536 7282	1 48.0
16	15 16 47.66 24.91	-16 52 13.8 99.2	20.45	1.96	0.652 7254 -7036	1 43.6
17	15 16 22.75 25.37	16 50 34.6 100.9	20.48	1.96	.652 0218 6786	1 39.3
18	15 15 57.38 25.82	16 48 53.7 102.6	20.51	1.96	.651 3432 6533	1 35.0
19	15 15 31.56 26.24	16 47 11.1 104.2	20.54	1.97	.650 6899 6275	1 30.6
20	15 15 05.32 26.64	16 45 26.9 105.8	20.57	1.97	.650 0624 6014	1 26.2
21	15 14 38.68 27.03	-16 43 41.1 107.3	20.60	1.97	0.649 4610 -5751	1 21.8
22	15 14 11.65 27.41	16 41 53.8 108.7	20.63	1.98	.648 8859 5484	1 17.5
23	15 13 44.24 27.76	16 40 05.1 110.1	20.66	1.98	.648 3375 5215	1 13.1
24	15 13 16.48 28.09	16 38 15.0 111.4	20.68	1.98	.647 8160 4941	1 08.7
25	15 12 48.39 28.42	16 36 23.6 112.7	20.70	1.98	.647 3219 4665	1 04.3
26	15 12 19.97 28.72	-16 34 30.9 113.8	20.73	1.98	0.646 8554 -4387	0 59.9
27	15 11 51.25 29.00	16 32 37.1 114.9	20.75	1.99	.646 4167 4104	0 55.5
28	15 11 22.25 29.27	16 30 42.2 116.0	20.77	1.99	.646 0063 3820	0 51.1
29	15 10 52.98 29.50	16 28 46.2 116.9	20.78	1.99	.645 6243 3531	0 46.6
30	15 10 23.48 29.72	16 26 49.3 117.7	20.80	1.99	.645 2712 3241	0 42.2
May 1	15 09 53.76 29.92	-16 24 51.6 118.6	20.82	1.99	0.644 9471 -2949	0 37.8
2	15 09 23.84 30.09	16 22 53.0 119.2	20.83	1.99	.644 6522 2655	0 33.4
3	15 08 53.75 30.25	16 20 53.8 119.9	20.84	2.00	.644 3867 2360	0 28.9
4	15 08 23.50 30.37	16 18 53.9 120.3	20.85	2.00	.644 1507 2065	0 24.5
5	15 07 53.13 30.49	16 16 53.6 120.8	20.86	2.00	.643 9442 1767	0 20.1
6	15 07 22.64 30.56	-16 14 52.8 121.1	20.87	2.00	0.643 7675 -1470	0 15.6
7	15 06 52.08 30.63	16 12 51.7 121.4	20.88	2.00	.643 6205 1171	0 11.2
8	15 06 21.45 30.66	16 10 50.3 121.6	20.89	2.00	.643 5034 872	0 06.8
9	15 05 50.79 30.69	16 08 48.7 121.6	20.89	2.00	.643 4162 574	{ 0 02.3 }
10	15 05 20.10 30.69	16 06 47.1 121.7	20.89	2.00	.643 3588 -277	{ 23 57.9 }
11	15 04 49.41 30.66	-16 04 45.4 121.6	20.89	2.00	0.643 3311 +22	23 53.5
12	15 04 18.75 30.62	16 02 43.8 121.4	20.89	2.00	.643 3333 +318	23 49.0
13	15 03 48.13 30.55	16 00 42.4 121.1	20.89	2.00	.643 3651 614	23 44.6
14	15 03 17.58 30.46	15 58 41.3 120.8	20.89	2.00	.643 4265 909	23 40.1
15	15 02 47.12 30.36	15 56 40.5 120.3	20.89	2.00	.643 5174 1203	23 35.7
16	15 02 16.76 30.23	-15 54 40.2 119.8	20.88	2.00	0.643 6377 +1496	23 31.3
17	15 01 46.53	-15 52 40.4	20.87	2.00	0.643 7873	23 26.8
						23 22.4

JUPITER, 1935

211

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
May 17	^{h m} 15 01 46.53 _{-30.09}	^{° ' "} -15 52 40.4 _{+119.3}	20.87	2.00	0.643 7873	^{h m} 23 22.4
18	15 01 16.44 _{29.91}	15 50 41.1 _{118.5}	20.86	2.00	.643 9661 ₊₁₇₈₈	23 18.0
19	15 00 46.53 _{29.73}	15 48 42.6 _{117.8}	20.85	2.00	.644 1738 ₂₀₇₇	23 13.5
20	15 00 16.80 _{29.52}	15 46 44.8 _{116.9}	20.84	2.00	.644 4104 ₂₃₆₆	23 09.1
21	14 59 47.28 _{29.30}	15 44 47.9 _{116.0}	20.83	1.99	.644 6757 ₂₆₅₃	23 04.7
22	14 59 17.98 _{-29.06}	-15 42 51.9 _{+115.0}	20.82	1.99	0.644 9694 ₊₃₂₂₁	23 00.3
23	14 58 48.92 _{28.80}	15 40 56.9 _{113.8}	20.80	1.99	.645 2915 ₃₅₀₁	22 55.9
24	14 58 20.12 _{28.53}	15 39 03.1 _{112.6}	20.78	1.99	.645 6416 ₃₇₈₀	22 51.5
25	14 57 51.59 _{28.23}	15 37 10.5 _{111.3}	20.77	1.99	.646 0196 ₄₀₅₇	22 47.1
26	14 57 23.36 _{27.91}	15 35 19.2 _{110.0}	20.75	1.99	.646 4253 ₄₃₃₁	22 42.7
27	14 56 55.45 _{-27.57}	-15 33 29.2 _{+108.5}	20.73	1.98	0.646 8584 ₊₄₆₀₄	22 38.3
28	14 56 27.88 _{27.22}	15 31 40.7 _{107.0}	20.70	1.98	.647 3188 ₄₈₇₂	22 33.9
29	14 56 00.66 _{26.85}	15 29 53.7 _{105.3}	20.68	1.98	.647 8060 ₅₁₃₉	22 29.5
30	14 55 33.81 _{26.45}	15 28 08.4 _{103.6}	20.66	1.98	.648 3199 ₅₄₀₂	22 25.2
31	14 55 07.36 _{26.05}	15 26 24.8 _{101.9}	20.63	1.98	.648 8601 ₅₆₆₁	22 20.8
June 1	14 54 41.31 _{-25.63}	-15 24 42.9 _{+100.0}	20.60	1.97	0.649 4262 ₊₅₉₁₆	22 16.4
2	14 54 15.68 _{25.18}	15 23 02.9 _{98.0}	20.58	1.97	.650 0178 ₆₁₆₈	22 12.1
3	14 53 50.50 _{24.72}	15 21 24.9 _{96.0}	20.55	1.97	.650 6346 ₆₄₁₅	22 07.7
4	14 53 25.78 _{24.25}	15 19 48.9 _{93.9}	20.52	1.96	.651 2761 ₆₆₅₈	22 03.4
5	14 53 01.53 _{23.76}	15 18 15.0 _{91.7}	20.49	1.96	.651 9419 ₆₈₉₇	21 59.1
6	14 52 37.77 _{-23.26}	-15 16 43.3 _{+89.4}	20.45	1.96	0.652 6316 ₊₇₁₃₁	21 54.8
7	14 52 14.51 _{22.75}	15 15 13.9 _{87.2}	20.42	1.95	.653 3447 ₇₃₆₁	21 50.5
8	14 51 51.76 _{22.21}	15 13 46.7 _{84.8}	20.38	1.95	.654 0808 ₇₅₈₆	21 46.2
9	14 51 29.55 _{21.67}	15 12 21.9 _{82.4}	20.35	1.95	.654 8394 ₇₈₀₆	21 41.9
10	14 51 07.88 _{21.13}	15 10 59.5 _{79.9}	20.31	1.94	.655 6200 ₈₀₂₂	21 37.6
11	14 50 46.75 _{-20.56}	-15 09 39.6 _{+77.5}	20.27	1.94	0.656 4222 ₊₈₂₃₂	21 33.3
12	14 50 26.19 _{19.98}	15 08 22.1 _{74.8}	20.24	1.94	.657 2454 ₈₄₃₉	21 29.0
13	14 50 06.21 _{19.40}	15 07 07.3 _{72.2}	20.20	1.93	.658 0893 ₈₆₃₉	21 24.8
14	14 49 46.81 _{18.80}	15 05 55.1 _{69.5}	20.16	1.93	.658 9532 ₈₈₃₆	21 20.5
15	14 49 28.01 _{18.21}	15 04 45.6 _{66.8}	20.12	1.93	.659 8368 ₉₀₂₈	21 16.3
16	14 49 09.80 _{-17.59}	-15 03 38.8 _{+64.1}	20.07	1.92	0.660 7396 ₊₉₂₁₅	21 12.1
17	14 48 52.21 _{16.97}	15 02 34.7 _{61.2}	20.03	1.92	.661 6611 ₉₃₉₆	21 07.9
18	14 48 35.24 _{16.35}	15 01 33.5 _{58.3}	19.99	1.91	.662 6007 ₉₅₇₅	21 03.7
19	14 48 18.89 _{15.71}	15 00 35.2 _{55.5}	19.94	1.91	.663 5582 ₉₇₄₇	20 59.5
20	14 48 03.18 _{15.07}	14 59 39.7 _{52.5}	19.90	1.90	.664 5329 ₉₉₁₅	20 55.3
21	14 47 48.11 _{-14.43}	-14 58 47.2 _{+49.6}	19.85	1.90	0.665 5244 ₊₁₀₀₇₉	20 51.1
22	14 47 33.68 _{13.77}	14 57 57.6 _{46.6}	19.81	1.90	.666 5323 ₁₀₂₃₈	20 47.0
23	14 47 19.91 _{13.11}	14 57 11.0 _{43.6}	19.76	1.89	.667 5561 ₁₀₃₉₃	20 42.8
24	14 47 06.80 _{12.44}	14 56 27.4 _{40.5}	19.71	1.89	.668 5954 ₁₀₅₄₃	20 38.7
25	14 46 54.36 _{11.76}	14 55 46.9 _{37.3}	19.67	1.88	.669 6497 ₁₀₆₈₉	20 34.5
26	14 46 42.60 _{-11.08}	-14 55 09.6 _{+34.2}	19.62	1.88	0.670 7186 ₊₁₀₈₃₀	20 30.4
27	14 46 31.52 _{10.39}	14 54 35.4 _{31.1}	19.57	1.87	.671 8016 ₁₀₉₆₅	20 26.3
28	14 46 21.13 _{9.70}	14 54 04.3 _{27.8}	19.52	1.87	.672 8981 ₁₁₀₉₄	20 22.2
29	14 46 11.43 _{9.00}	14 53 36.5 _{24.7}	19.47	1.86	.674 0075 ₁₁₂₂₀	20 18.1
30	14 46 02.43 _{8.30}	14 53 11.8 _{21.5}	19.42	1.86	.675 1295 ₁₁₃₃₉	20 14.1
July 1	14 45 54.13 _{-7.59}	-14 52 50.3 _{+18.2}	19.37	1.85	0.676 2634 ₊₁₁₄₅₄	20 10.0
2	14 45 46.54	-14 52 32.1	19.32	1.85	0.677 4088	20 06.0

JUPITER, 1935

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
July	^{h m s}	^{° ' "}				^{h m}
1	14 45 54.13 - 7.59	-14 52 50.3 + 18.2	19.37	1.85	0.676 2634	20 10.0
2	14 45 46.54 6.88	14 52 32.1 15.0	19.32	1.85	.677 4088 +11454	20 06.0
3	14 45 39.66 6.17	14 52 17.1 11.7	19.27	1.84	.678 5651 11563	20 01.9
4	14 45 33.49 5.46	14 52 05.4 8.4	19.22	1.84	.679 7317 11666	19 57.9
5	14 45 28.03 4.74	14 51 57.0 5.2	19.16	1.83	.680 9083 11766	19 53.9
6	14 45 23.29 - 4.02	-14 51 51.8 + 1.9	19.11	1.83	0.682 0943 +11950	19 49.9
7	14 45 19.27 3.31	14 51 49.9 - 1.4	19.06	1.82	.683 2893 12034	19 45.9
8	14 45 15.96 2.59	14 51 51.3 4.7	19.01	1.82	.684 4927 12113	19 41.9
9	14 45 13.37 1.87	14 51 56.0 7.9	18.95	1.81	.685 7040 12188	19 38.0
10	14 45 11.50 1.15	14 52 03.9 11.2	18.90	1.81	.686 9228 12258	19 34.0
11	14 45 10.35 - 0.43	-14 52 15.1 - 14.5	18.85	1.80	0.688 1486 +12323	19 30.1
12	14 45 09.92 + 0.29	14 52 29.6 17.7	18.79	1.80	.689 3809 12383	19 26.1
13	14 45 10.21 0.99	14 52 47.3 21.0	18.74	1.79	.690 6192 12440	19 22.2
14	14 45 11.20 1.71	14 53 08.3 24.2	18.69	1.79	.691 8632 12491	19 18.3
15	14 45 12.91 2.42	14 53 32.5 27.4	18.63	1.78	.693 1123 12539	19 14.4
16	14 45 15.33 + 3.12	-14 53 59.9 - 30.5	18.58	1.78	0.694 3662 +12583	19 10.5
17	14 45 18.45 3.82	14 54 30.4 33.7	18.52	1.77	.695 6245 12624	19 06.7
18	14 45 22.27 4.53	14 55 04.1 37.0	18.47	1.77	.696 8869 12661	19 02.8
19	14 45 26.80 5.24	14 55 41.1 40.0	18.42	1.76	.698 1530 12694	18 59.0
20	14 45 32.04 5.93	14 56 21.1 43.2	18.36	1.76	.699 4224 12723	18 55.1
21	14 45 37.97 + 6.63	-14 57 04.3 - 46.4	18.31	1.75	0.700 6947 +12748	18 51.3
22	14 45 44.60 7.33	14 57 50.7 49.4	18.26	1.75	.701 9695 12771	18 47.5
23	14 45 51.93 8.03	14 58 40.1 52.5	18.20	1.74	.703 2466 12789	18 43.7
24	14 45 59.96 8.72	14 59 32.6 55.6	18.15	1.74	.704 5255 12804	18 39.9
25	14 46 08.68 9.41	15 00 28.2 58.6	18.10	1.73	.705 8059 12813	18 36.1
26	14 46 18.09 +10.10	-15 01 26.8 - 61.7	18.04	1.73	0.707 0872 +12820	18 32.3
27	14 46 28.19 10.79	15 02 28.5 64.8	17.99	1.72	.708 3692 12823	18 28.6
28	14 46 38.98 11.47	15 03 33.3 67.7	17.94	1.72	.709 6515 12822	18 24.8
29	14 46 50.45 12.15	15 04 41.0 70.7	17.88	1.71	.710 9337 12817	18 21.1
30	14 47 02.60 12.83	15 05 51.7 73.6	17.83	1.71	.712 2154 12808	18 17.4
31	14 47 15.43 +13.50	-15 07 05.3 - 76.4	17.78	1.70	0.713 4962 +12796	18 13.7
Aug. 1	14 47 28.93 14.16	15 08 21.7 79.3	17.73	1.70	.714 7758 12781	18 10.0
2	14 47 43.09 14.84	15 09 41.0 82.2	17.67	1.69	.716 0539 12762	18 06.3
3	14 47 57.93 15.49	15 11 03.2 84.9	17.62	1.69	.717 3301 12739	18 02.6
4	14 48 13.42 16.15	15 12 28.1 87.8	17.57	1.68	.718 6040 12714	17 58.9
5	14 48 29.57 +16.80	-15 13 55.9 - 90.5	17.52	1.68	0.719 8754 +12685	17 55.3
6	14 48 46.37 17.45	15 15 26.4 93.1	17.47	1.67	.721 1439 12653	17 51.7
7	14 49 03.82 18.08	15 16 59.5 95.8	17.42	1.67	.722 4092 12618	17 48.0
8	14 49 21.90 18.72	15 18 35.3 98.4	17.37	1.66	.723 6710 12580	17 44.4
9	14 49 40.62 19.34	15 20 13.7 101.0	17.32	1.66	.724 9290 12539	17 40.8
10	14 49 59.96 +19.97	-15 21 54.7 - 103.5	17.27	1.65	0.726 1829 +12495	17 37.2
11	14 50 19.93 20.58	15 23 38.2 106.0	17.22	1.65	.727 4324 12450	17 33.6
12	14 50 40.51 21.19	15 25 24.2 108.5	17.17	1.64	.728 6774 12401	17 30.0
13	14 51 01.70 21.79	15 27 12.7 111.0	17.12	1.64	.729 9175 12351	17 26.4
14	14 51 23.49 22.40	15 29 03.7 113.3	17.07	1.63	.731 1526 12298	17 22.9
15	14 51 45.89 +22.99	-15 30 57.0 - 115.6	17.02	1.63	0.732 3824 +12244	17 19.3
16	14 52 08.88	15 32 52.6	16.97	1.62	0.733 6068	17 15.8

JUPITER, 1935

213

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Aug. 16	^{h m s} 14 52 08.88	^{° ' "} -15 32 52.6	16.97	1.62	0.733 6068	^{h m} 17 15.8
17	14 52 32.46 ^{+23.58}	15 34 50.5 ^{-117.9}	16.93	1.62	.734 8255 ⁺¹²¹⁸⁷	17 12.2
18	14 52 56.63 ^{24.17}	15 36 50.7 ^{120.2}	16.88	1.62	.736 0383 ¹²¹²⁸	17 08.7
19	14 53 21.38 ^{24.75}	15 38 53.1 ^{122.4}	16.83	1.61	.737 2450 ¹²⁰⁶⁷	17 05.2
20	14 53 46.71 ^{25.33}	15 40 57.8 ^{124.7}	16.78	1.61	.738 4454 ¹²⁰⁰⁴	17 01.7
	^{25.90}	^{126.8}			¹¹⁹³⁹	
21	14 54 12.61 ^{+26.47}	-15 43 04.6 ^{-129.0}	16.74	1.60	0.739 6393 ⁺¹¹⁸⁷¹	16 58.2
22	14 54 39.08 ^{27.03}	15 45 13.6 ^{131.0}	16.69	1.60	.740 8264 ¹¹⁸⁰¹	16 54.7
23	14 55 06.11 ^{27.60}	15 47 24.6 ^{133.1}	16.65	1.59	.742 0065 ¹¹⁷²⁹	16 51.2
24	14 55 33.71 ^{28.14}	15 49 37.7 ^{135.1}	16.60	1.59	.743 1794 ¹¹⁶⁵⁴	16 47.8
25	14 56 01.85 ^{28.69}	15 51 52.8 ^{137.1}	16.56	1.59	.744 3448 ¹¹⁵⁷⁸	16 44.3
26	14 56 30.54 ^{+29.24}	-15 54 09.9 ^{-139.0}	16.51	1.58	0.745 5026 ⁺¹¹⁴⁹⁹	16 40.9
27	14 56 59.78 ^{29.77}	15 56 28.9 ^{140.9}	16.47	1.58	.746 6525 ¹¹⁴¹⁸	16 37.4
28	14 57 29.55 ^{30.31}	15 58 49.8 ^{142.8}	16.43	1.57	.747 7943 ¹¹³³⁵	16 34.0
29	14 57 59.86 ^{30.84}	16 01 12.6 ^{144.6}	16.39	1.57	.748 9278 ¹¹²⁵⁰	16 30.6
30	14 58 30.70 ^{31.36}	16 03 37.2 ^{146.3}	16.34	1.56	.750 0528 ¹¹¹⁶³	16 27.1
31	14 59 02.06 ^{+31.88}	-16 06 03.5 ^{-148.0}	16.30	1.56	0.751 1691 ⁺¹¹⁰⁷⁴	16 23.7
Sept. 1	14 59 33.94 ^{32.39}	16 08 31.5 ^{149.8}	16.26	1.56	.752 2765 ¹⁰⁹⁸⁴	16 20.3
2	15 00 06.33 ^{32.90}	16 11 01.3 ^{151.3}	16.22	1.55	.753 3749 ¹⁰⁸⁹²	16 16.9
3	15 00 39.23 ^{33.39}	16 13 32.6 ^{152.9}	16.18	1.55	.754 4641 ¹⁰⁷⁹⁷	16 13.6
4	15 01 12.62 ^{33.88}	16 16 05.5 ^{154.5}	16.14	1.54	.755 5438 ¹⁰⁷⁰¹	16 10.2
5	15 01 46.50 ^{+34.37}	-16 18 40.0 ^{-156.0}	16.10	1.54	0.756 6139 ⁺¹⁰⁶⁰⁴	16 06.8
6	15 02 20.87 ^{34.84}	16 21 16.0 ^{157.5}	16.06	1.54	.757 6743 ¹⁰⁵⁰⁵	16 03.5
7	15 02 55.71 ^{35.32}	16 23 53.5 ^{158.9}	16.02	1.53	.758 7248 ¹⁰⁴⁰⁵	16 00.1
8	15 03 31.03 ^{35.78}	16 26 32.4 ^{160.2}	15.98	1.53	.759 7653 ¹⁰³⁰³	15 56.8
9	15 04 06.81 ^{36.25}	16 29 12.6 ^{161.5}	15.94	1.53	.760 7956 ¹⁰²⁰¹	15 53.5
10	15 04 43.06 ^{+36.70}	-16 31 54.1 ^{-162.9}	15.91	1.52	0.761 8157 ⁺¹⁰⁰⁹⁷	15 50.1
11	15 05 19.76 ^{37.16}	16 34 37.0 ^{164.0}	15.87	1.52	.762 8254 ⁹⁹⁹³	15 46.8
12	15 05 56.92 ^{37.60}	16 37 21.0 ^{165.3}	15.83	1.52	.763 8247 ⁹⁸⁸⁷	15 43.5
13	15 06 34.52 ^{38.03}	16 40 06.3 ^{166.4}	15.80	1.51	.764 8134 ⁹⁷⁸¹	15 40.2
14	15 07 12.55 ^{38.47}	16 42 52.7 ^{167.6}	15.76	1.51	.765 7915 ⁹⁶⁷³	15 36.9
15	15 07 51.02 ^{+38.90}	-16 45 40.3 ^{-168.7}	15.73	1.51	0.766 7588 ⁺⁹⁵⁶⁵	15 33.6
16	15 08 29.92 ^{39.32}	16 48 29.0 ^{169.7}	15.69	1.50	.767 7153 ⁹⁴⁵⁵	15 30.3
17	15 09 09.24 ^{39.74}	16 51 18.7 ^{170.7}	15.66	1.50	.768 6608 ⁹³⁴⁴	15 27.0
18	15 09 48.98 ^{40.16}	16 54 09.4 ^{171.7}	15.62	1.50	.769 5952 ⁹²³³	15 23.8
19	15 10 29.14 ^{40.56}	16 57 01.1 ^{172.6}	15.59	1.49	.770 5185 ⁹¹¹⁹	15 20.5
20	15 11 09.70 ^{+40.98}	-16 59 53.7 ^{-173.6}	15.56	1.49	0.771 4304 ⁺⁹⁰⁰⁵	15 17.2
21	15 11 50.68 ^{41.39}	17 02 47.3 ^{174.4}	15.53	1.49	.772 3309 ⁸⁸⁹⁰	15 14.0
22	15 12 32.07 ^{41.78}	17 05 41.7 ^{175.3}	15.49	1.48	.773 2199 ⁸⁷⁷²	15 10.8
23	15 13 13.85 ^{42.18}	17 08 37.0 ^{176.0}	15.46	1.48	.774 0971 ⁸⁶⁵⁴	15 07.5
24	15 13 56.03 ^{42.56}	17 11 33.0 ^{176.8}	15.43	1.48	.774 9625 ⁸⁵³⁵	15 04.3
25	15 14 38.59 ^{+42.94}	-17 14 29.8 ^{-177.5}	15.40	1.47	0.775 8160 ⁺⁸⁴¹⁴	15 01.1
26	15 15 21.53 ^{43.32}	17 17 27.3 ^{178.1}	15.37	1.47	.776 6574 ⁸²⁹³	14 57.9
27	15 16 04.85 ^{43.69}	17 20 25.4 ^{178.8}	15.34	1.47	.777 4867 ⁸¹⁷⁰	14 54.7
28	15 16 48.54 ^{44.05}	17 23 24.2 ^{179.3}	15.31	1.47	.778 3037 ⁸⁰⁴⁶	14 51.5
29	15 17 32.59 ^{44.41}	17 26 23.5 ^{179.9}	15.28	1.46	.779 1083 ⁷⁹²¹	14 48.3
30	15 18 17.00 ^{+44.77}	-17 29 23.4 ^{-180.3}	15.26	1.46	0.779 9004 ⁺⁷⁷⁹⁶	14 45.1
Oct. 1	15 19 01.77	17 32 23.7	15.23	1.46	0.780 6800	14 41.9

JUPITER, 1935

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Oct. 1	^{h m s} 15 19 01.77 ^{+45.11}	^{° ' "} -17 32 23.7 ^{-180.8}	15.23	1.46	0.780 6800	^{h m} 14 41.9
2	15 19 46.88 ^{45.45}	17 35 24.5 ^{181.2}	15.20	1.46	.781 4469 ^{+ 7669}	14 38.7
3	15 20 32.33 ^{45.79}	17 38 25.7 ^{181.6}	15.18	1.45	.782 2009 ⁷⁵⁴⁰	14 35.5
4	15 21 18.12 ^{46.11}	17 41 27.3 ^{182.0}	15.15	1.45	.782 9422 ⁷⁴¹³	14 32.4
5	15 22 04.23 ^{46.44}	17 44 29.3 ^{182.3}	15.13	1.45	.783 6705 ⁷²⁸³	14 29.2
6	15 22 50.67 ^{+46.76}	-17 47 31.6 ^{-182.5}	15.10	1.45	0.784 3859 ^{+ 7025}	14 26.0
7	15 23 37.43 ^{47.07}	17 50 34.1 ^{182.7}	15.08	1.44	.785 0884 ⁶⁸⁹⁵	14 22.9
8	15 24 24.50 ^{47.37}	17 53 36.8 ^{183.0}	15.05	1.44	.785 7779 ⁶⁷⁶³	14 19.7
9	15 25 11.87 ^{47.67}	17 56 39.8 ^{183.0}	15.03	1.44	.786 4542 ⁶⁶³²	14 16.6
10	15 25 59.54 ^{47.97}	17 59 42.8 ^{183.2}	15.01	1.44	.787 1174 ⁶⁵⁰⁰	14 13.5
11	15 26 47.51 ^{+48.26}	-18 02 46.0 ^{-183.3}	14.98	1.43	0.787 7674 ^{+ 6368}	14 10.3
12	15 27 35.77 ^{48.54}	18 05 49.3 ^{183.3}	14.96	1.43	.788 4042 ⁶²³⁵	14 07.2
13	15 28 24.31 ^{48.83}	18 08 52.6 ^{183.3}	14.94	1.43	.789 0277 ⁶¹⁰²	14 04.1
14	15 29 13.14 ^{49.11}	18 11 55.9 ^{183.4}	14.92	1.43	.789 6379 ⁵⁹⁶⁹	14 01.0
15	15 30 02.25 ^{49.38}	18 14 59.3 ^{183.3}	14.90	1.43	.790 2348 ⁵⁸³⁶	13 57.8
16	15 30 51.63 ^{+49.65}	-18 18 02.6 ^{-183.2}	14.88	1.42	0.790 8184 ^{+ 5701}	13 54.7
17	15 31 41.28 ^{49.91}	18 21 05.8 ^{183.2}	14.86	1.42	.791 3885 ⁵⁵⁶⁵	13 51.6
18	15 32 31.19 ^{50.18}	18 24 09.0 ^{183.0}	14.84	1.42	.791 9450 ⁵⁴³⁰	13 48.5
19	15 33 21.37 ^{50.43}	18 27 12.0 ^{182.8}	14.82	1.42	.792 4880 ⁵²⁹²	13 45.4
20	15 34 11.80 ^{50.68}	18 30 14.8 ^{182.6}	14.80	1.42	.793 0172 ⁵¹⁵⁴	13 42.3
21	15 35 02.48 ^{+50.93}	-18 33 17.4 ^{-182.4}	14.79	1.42	0.793 5326 ^{+ 5016}	13 39.3
22	15 35 53.41 ^{51.16}	18 36 19.8 ^{182.1}	14.77	1.41	.794 0342 ⁴⁸⁷⁷	13 36.2
23	15 36 44.57 ^{51.40}	18 39 21.9 ^{181.8}	14.75	1.41	.794 5219 ⁴⁷³⁸	13 33.1
24	15 37 35.97 ^{51.63}	18 42 23.7 ^{181.5}	14.74	1.41	.794 9957 ⁴⁵⁹⁷	13 30.0
25	15 38 27.60 ^{51.85}	18 45 25.2 ^{181.1}	14.72	1.41	.795 4554 ⁴⁴⁵⁷	13 26.9
26	15 39 19.45 ^{+52.07}	-18 48 26.3 ^{-180.7}	14.70	1.41	0.795 9011 ^{+ 4315}	13 23.8
27	15 40 11.52 ^{52.29}	18 51 27.0 ^{180.3}	14.69	1.41	.796 3326 ⁴¹⁷⁴	13 20.8
28	15 41 03.81 ^{52.50}	18 54 27.3 ^{179.8}	14.68	1.41	.796 7500 ⁴⁰³¹	13 17.7
29	15 41 56.31 ^{52.70}	18 57 27.1 ^{179.3}	14.66	1.40	.797 1531 ³⁸⁸⁹	13 14.7
30	15 42 49.01 ^{52.89}	19 00 26.4 ^{178.8}	14.65	1.40	.797 5420 ³⁷⁴⁴	13 11.6
Nov. 1	15 43 41.90 ^{+53.07}	-19 03 25.2 ^{-178.2}	14.64	1.40	0.797 9164 ^{+ 3601}	13 08.6
2	15 44 34.97 ^{53.26}	19 06 23.4 ^{177.6}	14.63	1.40	.798 2765 ³⁴⁵⁶	13 05.5
3	15 45 28.23 ^{53.43}	19 09 21.0 ^{177.0}	14.61	1.40	.798 6221 ³³¹²	13 02.5
4	15 46 21.66 ^{53.61}	19 12 18.0 ^{176.3}	14.60	1.40	.798 9533 ³¹⁶⁸	12 59.4
5	15 47 15.27 ^{53.77}	19 15 14.3 ^{175.7}	14.59	1.40	.799 2701 ³⁰²³	12 56.4
6	15 48 09.04 ^{+53.93}	-19 18 10.0 ^{-174.9}	14.58	1.40	0.799 5724 ^{+ 2878}	12 53.3
7	15 49 02.97 ^{54.09}	19 21 04.9 ^{174.2}	14.57	1.40	.799 8602 ²⁷³⁴	12 50.3
8	15 49 57.06 ^{54.24}	19 23 59.1 ^{173.4}	14.56	1.39	.800 1336 ²⁵⁹⁰	12 47.3
9	15 50 51.30 ^{54.37}	19 26 52.5 ^{172.6}	14.55	1.39	.800 3926 ²⁴⁴⁶	12 44.2
10	15 51 45.67 ^{54.52}	19 29 45.1 ^{171.8}	14.55	1.39	.800 6372 ²³⁰¹	12 41.2
11	15 52 40.19 ^{+54.65}	-19 32 36.9 ^{-170.9}	14.54	1.39	0.800 8673 ^{+ 2156}	12 38.2
12	15 53 34.84 ^{54.78}	19 35 27.8 ^{170.2}	14.53	1.39	.801 0829 ²⁰¹⁰	12 35.2
13	15 54 29.62 ^{54.91}	19 38 18.0 ^{169.3}	14.52	1.39	.801 2839 ¹⁸⁶⁵	12 32.1
14	15 55 24.53 ^{55.03}	19 41 07.3 ^{168.5}	14.52	1.39	.801 4704 ¹⁷¹⁹	12 29.1
15	15 56 19.56 ^{55.15}	19 43 55.8 ^{167.6}	14.51	1.39	.801 6423 ¹⁵⁷³	12 26.1
16	15 57 14.71 ^{+55.26}	-19 46 43.4 ^{-166.6}	14.51	1.39	0.801 7996 ^{+ 1427}	12 23.1
	15 58 09.97	19 49 30.0	14.50	1.39	0.801 9423	12 20.1

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Nov. 16	^{h m s} 15 58 09.97 ^{+55.37}	^{° ' "} -19 49 30.0 ^{-165.6}	14.50	1.39	0.801 9423 ^{+ 1281}	^{h m} 12 20.1
17	15 59 05.34 ^{55.47}	19 52 15.6 ^{164.6}	14.50	1.39	.802 0704 ¹¹³⁴	12 17.0
18	16 00 00.81 ^{55.56}	19 55 00.2 ^{163.7}	14.49	1.39	.802 1838 ⁹⁸⁶	12 14.0
19	16 00 56.37 ^{55.66}	19 57 43.9 ^{162.6}	14.49	1.39	.802 2824 ⁸³⁸	12 11.0
20	16 01 52.03 ^{55.74}	20 00 26.5 ^{161.5}	14.49	1.39	.802 3662 ⁶⁸⁹	12 08.0
21	16 02 47.77 ^{+55.82}	-20 03 08.0 ^{-160.4}	14.49	1.39	0.802 4351 ^{+ 540}	12 05.0
22	16 03 43.59 ^{55.89}	20 05 48.4 ^{159.4}	14.48	1.39	.802 4891 ³⁹⁰	12 02.0
23	16 04 39.48 ^{55.96}	20 08 27.8 ^{158.2}	14.48	1.39	.802 5281 ²⁴²	11 59.0
24	16 05 35.44 ^{56.02}	20 11 06.0 ^{157.0}	14.48	1.39	.802 5523 ^{+ .92}	11 56.0
25	16 06 31.46 ^{56.07}	20 13 43.0 ^{155.8}	14.48	1.39	.802 5615 ^{- 57}	11 53.0
26	16 07 27.53 ^{+56.12}	-20 16 18.8 ^{-154.7}	14.48	1.39	0.802 5558 ^{- 207}	11 50.0
27	16 08 23.65 ^{56.17}	20 18 53.5 ^{153.5}	14.48	1.39	.802 5351 ³⁵⁷	11 47.0
28	16 09 19.82 ^{56.20}	20 21 27.0 ^{152.3}	14.48	1.39	.802 4994 ⁵⁰⁸	11 44.0
29	16 10 16.02 ^{56.23}	20 23 59.3 ^{151.0}	14.48	1.39	.802 4486 ⁶⁵⁷	11 41.0
30	16 11 12.25 ^{56.25}	20 26 30.3 ^{149.8}	14.49	1.39	.802 3829 ⁸⁰⁷	11 38.0
Dec. 1	16 12 08.50 ^{+56.26}	-20 29 00.1 ^{-148.5}	14.49	1.39	0.802 3022 ^{- 957}	11 35.0
2	16 13 04.76 ^{56.27}	20 31 28.6 ^{147.2}	14.49	1.39	.802 2065 ¹¹⁰⁸	11 32.0
3	16 14 01.03 ^{56.28}	20 33 55.8 ^{145.9}	14.50	1.39	.802 0957 ¹²⁵⁶	11 29.0
4	16 14 57.31 ^{56.27}	20 36 21.7 ^{144.5}	14.50	1.39	.801 9701 ¹⁴⁰⁶	11 26.0
5	16 15 53.58 ^{56.26}	20 38 46.2 ^{143.2}	14.51	1.39	.801 8295 ¹⁵⁵⁵	11 23.0
6	16 16 49.84 ^{+56.25}	-20 41 09.4 ^{-141.9}	14.51	1.39	0.801 6740 ^{- 1703}	11 20.0
7	16 17 46.09 ^{56.24}	20 43 31.3 ^{140.5}	14.52	1.39	.801 5037 ¹⁸⁵¹	11 17.0
8	16 18 42.33 ^{56.21}	20 45 51.8 ^{139.1}	14.52	1.39	.801 3186 ²⁰⁰⁰	11 14.0
9	16 19 38.54 ^{56.18}	20 48 10.9 ^{137.8}	14.53	1.39	.801 1186 ²¹⁴⁷	11 11.0
10	16 20 34.72 ^{56.14}	20 50 28.7 ^{136.4}	14.54	1.39	.800 9039 ²²⁹⁶	11 08.0
11	16 21 30.86 ^{+56.11}	-20 52 45.1 ^{-134.9}	14.55	1.39	0.800 6743 ^{- 2445}	11 05.0
12	16 22 26.97 ^{56.06}	20 55 00.0 ^{133.6}	14.55	1.39	.800 4298 ²⁵⁹³	11 02.0
13	16 23 23.03 ^{56.01}	20 57 13.6 ^{132.1}	14.56	1.39	.800 1705 ²⁷⁴¹	10 59.0
14	16 24 19.04 ^{55.95}	20 59 25.7 ^{130.7}	14.57	1.40	.799 8964 ²⁸⁹¹	10 56.0
15	16 25 14.99 ^{55.89}	21 01 36.4 ^{129.2}	14.58	1.40	.799 6073 ³⁰⁴⁰	10 53.0
16	16 26 10.88 ^{+55.83}	-21 03 45.6 ^{-127.8}	14.59	1.40	0.799 3033 ^{- 3188}	10 50.0
17	16 27 06.71 ^{55.74}	21 05 53.4 ^{126.2}	14.60	1.40	.798 9845 ³³³⁷	10 47.0
18	16 28 02.45 ^{55.67}	21 07 59.6 ^{124.8}	14.61	1.40	.798 6508 ³⁴⁸⁶	10 44.0
19	16 28 58.12 ^{55.58}	21 10 04.4 ^{123.4}	14.62	1.40	.798 3022 ³⁶³⁵	10 41.0
20	16 29 53.70 ^{55.48}	21 12 07.8 ^{121.8}	14.64	1.40	.797 9387 ³⁷⁸³	10 38.0
21	16 30 49.18 ^{+55.38}	-21 14 09.6 ^{-120.3}	14.65	1.40	0.797 5604 ^{- 3931}	10 34.9
22	16 31 44.56 ^{55.27}	21 16 09.9 ^{118.8}	14.66	1.40	.797 1673 ⁴⁰⁸⁰	10 31.9
23	16 32 39.83 ^{55.16}	21 18 08.7 ^{117.3}	14.68	1.41	.796 7593 ⁴²²⁹	10 28.9
24	16 33 34.99 ^{55.03}	21 20 06.0 ^{115.7}	14.69	1.41	.796 3364 ⁴³⁷⁷	10 25.9
25	16 34 30.02 ^{54.90}	21 22 01.7 ^{114.2}	14.70	1.41	.795 8987 ⁴⁵²⁵	10 22.9
26	16 35 24.92 ^{+54.77}	-21 23 55.9 ^{-112.7}	14.72	1.41	0.795 4462 ^{- 4674}	10 19.9
27	16 36 19.69 ^{54.62}	21 25 48.6 ^{111.2}	14.74	1.41	.794 9788 ⁴⁸²²	10 16.8
28	16 37 14.31 ^{54.47}	21 27 39.8 ^{109.6}	14.75	1.41	.794 4966 ⁴⁹⁶⁹	10 13.8
29	16 38 08.78 ^{54.32}	21 29 29.4 ^{108.0}	14.77	1.41	.793 9997 ⁵¹¹⁵	10 10.8
30	16 39 03.10 ^{54.14}	21 31 17.4 ^{106.5}	14.79	1.42	.793 4882 ⁵²⁶²	10 07.7
31	16 39 57.24 ^{+53.97}	-21 33 03.9 ^{-105.0}	14.80	1.42	0.792 9620 ^{- 5407}	10 04.7
32	16 40 51.21	-21 34 48.9	14.82	1.42	0.792 4213	10 01.7

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Jan. 1	^{h m s} 21 51 00.92	^{° ' "} -14 29 08.3	7.13	0.84	1.019 5570	^{h m s} 15 09.5
2	21 51 23.59	14 27 08.5	7.12	0.84	0.020 0429	15 06.3
3	21 51 46.48	14 25 07.5	7.11	0.84	0.020 5204	15 02.8
4	21 52 09.59	14 23 05.4	7.11	0.84	0.020 9894	14 59.2
5	21 52 32.91	14 21 02.0	7.10	0.84	0.021 4496	14 55.7
6	21 52 56.44	-14 18 57.5	7.09	0.84	1.021 9011	14 52.2
7	21 53 20.16	14 16 51.8	7.08	0.83	0.022 3437	14 48.6
8	21 53 44.09	14 14 45.1	7.08	0.83	0.022 7774	14 45.1
9	21 54 08.20	14 12 37.3	7.07	0.83	0.023 2021	14 41.6
10	21 54 32.49	14 10 28.5	7.06	0.83	0.023 6176	14 38.0
11	21 54 56.97	-14 08 18.6	7.06	0.83	1.024 0240	14 34.5
12	21 55 21.63	14 06 07.8	7.05	0.83	0.024 4212	14 31.0
13	21 55 46.46	14 03 55.9	7.04	0.83	0.024 8091	14 27.5
14	21 56 11.45	14 01 43.2	7.04	0.83	0.025 1877	14 23.9
15	21 56 36.60	13 59 29.5	7.03	0.83	0.025 5569	14 20.4
16	21 57 01.92	-13 57 14.9	7.03	0.83	1.025 9167	14 16.9
17	21 57 27.38	13 54 59.4	7.02	0.83	0.026 2670	14 13.4
18	21 57 52.99	13 52 43.1	7.01	0.83	0.026 6079	14 09.9
19	21 58 18.74	13 50 25.9	7.01	0.83	0.026 9391	14 06.4
20	21 58 44.63	13 48 07.9	7.00	0.83	0.027 2607	14 02.9
21	21 59 10.66	-13 45 49.1	7.00	0.83	1.027 5726	13 59.4
22	21 59 36.82	13 43 29.4	6.99	0.83	0.027 8748	13 55.9
23	22 00 03.11	13 41 09.1	6.99	0.82	0.028 1673	13 52.4
24	22 00 29.52	13 38 48.0	6.98	0.82	0.028 4500	13 48.9
25	22 00 56.04	13 36 26.1	6.98	0.82	0.028 7229	13 45.4
26	22 01 22.68	-13 34 03.6	6.98	0.82	1.028 9860	13 41.9
27	22 01 49.43	13 31 40.4	6.97	0.82	0.029 2391	13 38.5
28	22 02 16.28	13 29 16.6	6.97	0.82	0.029 4822	13 35.0
29	22 02 43.23	13 26 52.1	6.96	0.82	0.029 7153	13 31.5
30	22 03 10.29	13 24 27.0	6.96	0.82	0.029 9384	13 28.0
31	22 03 37.43	-13 22 01.4	6.96	0.82	1.030 1513	13 24.5
Feb. 1	22 04 04.66	13 19 35.1	6.95	0.82	0.030 3541	13 21.0
2	22 04 31.97	13 17 08.3	6.95	0.82	0.030 5467	13 17.6
3	22 04 59.35	13 14 41.0	6.95	0.82	0.030 7290	13 14.1
4	22 05 26.81	13 12 13.2	6.94	0.82	0.030 9010	13 10.6
5	22 05 54.34	-13 09 44.9	6.94	0.82	1.031 0627	13 07.2
6	22 06 21.93	13 07 16.3	6.94	0.82	0.031 2140	13 03.7
7	22 06 49.58	13 04 47.2	6.94	0.82	0.031 3550	13 00.2
8	22 07 17.28	13 02 17.8	6.94	0.82	0.031 4856	12 56.7
9	22 07 45.03	12 59 48.0	6.93	0.82	0.031 6058	12 53.3
10	22 08 12.82	-12 57 17.8	6.93	0.82	1.031 7157	12 49.8
11	22 08 40.64	12 54 47.4	6.93	0.82	0.031 8153	12 46.3
12	22 09 08.50	12 52 16.7	6.93	0.82	0.031 9045	12 42.8
13	22 09 36.39	12 49 45.8	6.93	0.82	0.031 9833	12 39.4
14	22 10 04.30	12 47 14.7	6.93	0.82	0.032 0518	12 35.9
15	22 10 32.24	-12 44 43.3	6.93	0.82	1.032 1100	12 32.4
16	22 11 00.19	12 42 11.8	6.93	0.82	1.032 1578	12 29.0

SATURN, 1935

217

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Feb. 16	^{h m s} 22 11 00.19	^{° ′ ″} -12 42 11.8	6.93	0.82	I.032 1578	^{h m} 12 29.0
17	22 11 28.15 ^{+27.96}	12 39 40.1 ^{+151.7}	6.92	0.82	0.32 1953 ^{+ 375}	12 25.5
18	22 11 56.13 ^{27.98}	12 37 08.3 ^{151.8}	6.92	0.82	0.32 2224 ²⁷¹	12 22.0
19	22 12 24.10 ^{27.97}	12 34 36.4 ^{151.9}	6.92	0.82	0.32 2392 ¹⁶⁸	12 18.6
20	22 12 52.08 ^{27.98}	12 32 04.4 ^{152.0}	6.92	0.82	0.32 2457 ^{+ 65}	12 15.1
21	22 13 20.05 ^{27.97}	-12 29 32.4 ^{+152.2}	6.92	0.82	I.032 2419 ^{- 142}	12 11.6
22	22 13 48.02 ^{27.95}	12 27 00.2 ^{152.1}	6.92	0.82	0.32 2277 ²⁴⁵	12 08.2
23	22 14 15.97 ^{27.94}	12 24 28.1 ^{152.1}	6.92	0.82	0.32 2032 ³⁴⁷	12 04.7
24	22 14 43.91 ^{27.92}	12 21 56.0 ^{152.1}	6.93	0.82	0.32 1685 ⁴⁵¹	12 01.2
25	22 15 11.83 ^{27.89}	12 19 23.9 ^{152.1}	6.93	0.82	0.32 1234 ⁵⁵⁴	11 57.8
26	22 15 39.72 ^{+27.86}	-12 16 51.8 ^{+152.0}	6.93	0.82	I.032 0680 ^{- 657}	11 54.3
27	22 16 07.58 ^{27.84}	12 14 19.8 ^{151.8}	6.93	0.82	0.32 0023 ⁷⁶⁰	11 50.8
28	22 16 35.42 ^{27.79}	12 11 48.0 ^{151.8}	6.93	0.82	0.31 9263 ⁸⁶⁴	11 47.3
Mar. 1	22 17 03.21 ^{27.76}	12 09 16.2 ^{151.5}	6.93	0.82	0.31 8399 ⁹⁶⁷	11 43.9
2	22 17 30.97 ^{27.71}	12 06 44.7 ^{151.4}	6.93	0.82	0.31 7432 ¹⁰⁷⁰	11 40.4
3	22 17 58.68 ^{+27.66}	-12 04 13.3 ^{+151.2}	6.93	0.82	I.031 6362 ⁻¹¹⁷³	11 36.9
4	22 18 26.34 ^{27.61}	12 01 42.1 ^{150.9}	6.94	0.82	0.31 5189 ¹²⁷⁶	11 33.4
5	22 18 53.95 ^{27.54}	11 59 11.2 ^{150.6}	6.94	0.82	0.31 3913 ¹³⁷⁷	11 30.0
6	22 19 21.49 ^{27.47}	11 56 40.6 ^{150.3}	6.94	0.82	0.31 2536 ¹⁴⁸⁰	11 26.5
7	22 19 48.96 ^{27.41}	11 54 10.3 ^{150.0}	6.94	0.82	0.31 1056 ¹⁵⁸²	11 23.0
8	22 20 16.37 ^{+27.34}	-11 51 40.3 ^{+149.7}	6.94	0.82	I.030 9474 ⁻¹⁶⁸³	11 19.5
9	22 20 43.71 ^{27.26}	11 49 10.6 ^{149.2}	6.95	0.82	0.30 7791 ¹⁷⁸⁵	11 16.1
10	22 21 10.97 ^{27.17}	11 46 41.4 ^{148.9}	6.95	0.82	0.30 6006 ¹⁸⁸⁵	11 12.6
11	22 21 38.14 ^{27.09}	11 44 12.5 ^{148.4}	6.95	0.82	0.30 4121 ¹⁹⁸⁴	11 09.1
12	22 22 05.23 ^{27.00}	11 41 44.1 ^{148.0}	6.96	0.82	0.30 2137 ²⁰⁸⁴	11 05.6
13	22 22 32.23 ^{+26.90}	-11 39 16.1 ^{+147.5}	6.96	0.82	I.030 0053 ⁻²¹⁸⁴	11 02.1
14	22 22 59.13 ^{26.80}	11 36 48.6 ^{146.9}	6.96	0.82	0.29 7869 ²²⁸²	10 58.6
15	22 23 25.93 ^{26.71}	11 34 21.7 ^{146.4}	6.97	0.82	0.29 5587 ²³⁷⁹	10 55.1
16	22 23 52.64 ^{26.60}	11 31 55.3 ^{145.8}	6.97	0.82	0.29 3208 ²⁴⁷⁸	10 51.7
17	22 24 19.24 ^{26.49}	11 29 29.5 ^{145.3}	6.97	0.82	0.29 0730 ²⁵⁷⁵	10 48.2
18	22 24 45.73 ^{+26.37}	-11 27 04.2 ^{+144.6}	6.98	0.82	I.028 8155 ⁻²⁶⁷¹	10 44.7
19	22 25 12.10 ^{26.27}	11 24 39.6 ^{144.0}	6.98	0.82	0.28 5484 ²⁷⁶⁷	10 41.2
20	22 25 38.37 ^{26.14}	11 22 15.6 ^{143.4}	6.99	0.82	0.28 2717 ²⁸⁶³	10 37.7
21	22 26 04.51 ^{26.01}	11 19 52.2 ^{142.7}	6.99	0.83	0.27 9854 ²⁹⁵⁹	10 34.2
22	22 26 30.52 ^{25.89}	11 17 29.5 ^{142.0}	7.00	0.83	0.27 6895 ³⁰⁵³	10 30.7
23	22 26 56.41 ^{+25.75}	-11 15 07.5 ^{+141.3}	7.00	0.83	I.027 3842 ⁻³¹⁴⁸	10 27.2
24	22 27 22.16 ^{25.62}	11 12 46.2 ^{140.6}	7.01	0.83	0.27 0694 ³²⁴²	10 23.7
25	22 27 47.78 ^{25.48}	11 10 25.6 ^{139.7}	7.01	0.83	0.26 7452 ³³³⁶	10 20.2
26	22 28 13.26 ^{25.34}	11 08 05.9 ^{139.0}	7.02	0.83	0.26 4116 ³⁴²⁹	10 16.7
27	22 28 38.60 ^{25.19}	11 05 46.9 ^{138.1}	7.02	0.83	0.26 0687 ³⁵²²	10 13.1
28	22 29 03.79 ^{+25.04}	-11 03 28.8 ^{+137.3}	7.03	0.83	I.025 7165 ⁻³⁶¹⁵	10 09.6
29	22 29 28.83 ^{24.89}	11 01 11.5 ^{136.4}	7.03	0.83	0.25 3550 ³⁷⁰⁵	10 06.1
30	22 29 53.72 ^{24.73}	10 58 55.1 ^{135.5}	7.04	0.83	0.24 9845 ³⁷⁹⁷	10 02.6
31	22 30 18.45 ^{24.57}	10 56 39.6 ^{134.6}	7.05	0.83	0.24 6048 ³⁸⁸⁸	9 59.1
Apr. 1	22 30 43.02 ^{24.40}	10 54 25.0 ^{133.6}	7.05	0.83	0.24 2160 ³⁹⁷⁸	9 55.6
2	22 31 07.42 ^{+24.22}	-10 52 11.4 ^{+132.5}	7.06	0.83	I.023 8182 ⁻⁴⁰⁶⁸	9 52.0
3	22 31 31.64 ^{24.00}	10 49 58.9 ^{131.5}	7.07	0.83	I.023 4114 ⁻⁴¹⁵⁸	9 48.5

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Apr. 1	^{h m s} 22 30 43.02 +24.40	^{° ' "} -10 54 25.0 +133.6	7.05	0.83	I.024 2160 -3978	^{h m} 9 55.6
2	22 31 07.42 24.22	10 52 11.4 132.5	7.06	0.83	.023 8182 4068	9 52.0
3	22 31 31.64 24.05	10 49 58.9 131.6	7.07	0.83	.023 4114 4156	9 48.5
4	22 31 55.69 23.87	10 47 47.3 130.5	7.07	0.83	.022 9958 4244	9 44.9
5	22 32 19.56 23.68	10 45 36.8 129.4	7.08	0.83	.022 5714 4331	9 41.4
6	22 32 43.24 +23.50	-10 43 27.4 +128.3	7.09	0.83	I.022 1383 -4417	9 37.9
7	22 33 06.74 23.30	10 41 19.1 127.2	7.09	0.84	.021 6966 4502	9 34.3
8	22 33 30.04 23.11	10 39 11.9 126.0	7.10	0.84	.021 2464 4586	9 30.8
9	22 33 53.15 22.91	10 37 05.9 124.9	7.11	0.84	.020 7878 4669	9 27.2
10	22 34 16.06 22.70	10 35 01.0 123.6	7.12	0.84	.020 3209 4752	9 23.7
11	22 34 38.76 +22.50	-10 32 57.4 +122.5	7.12	0.84	I.019 8457 -4834	9 20.1
12	22 35 01.26 22.29	10 30 54.9 121.2	7.13	0.84	.019 3623 4914	9 16.6
13	22 35 23.55 22.07	10 28 53.7 119.9	7.14	0.84	.018 8709 4994	9 13.0
14	22 35 45.62 21.86	10 26 53.8 118.7	7.15	0.84	.018 3715 5072	9 09.5
15	22 36 07.48 21.64	10 24 55.1 117.3	7.16	0.84	.017 8643 5149	9 05.9
16	22 36 29.12 +21.42	-10 22 57.8 +116.0	7.17	0.84	I.017 3494 -5227	9 02.3
17	22 36 50.54 21.19	10 21 01.8 114.6	7.17	0.85	.016 8267 5303	8 58.7
18	22 37 11.73 20.96	10 19 07.2 113.3	7.18	0.85	.016 2964 5378	8 55.1
19	22 37 32.69 20.72	10 17 13.9 111.9	7.19	0.85	.015 7586 5452	8 51.5
20	22 37 53.41 20.50	10 15 22.0 110.4	7.20	0.85	.015 2134 5525	8 47.9
21	22 38 13.91 +20.25	-10 13 31.6 +109.0	7.21	0.85	I.014 6609 -5598	8 44.3
22	22 38 34.16 20.01	10 11 42.6 107.6	7.22	0.85	.014 1011 5669	8 40.8
23	22 38 54.17 19.76	10 09 55.0 106.0	7.23	0.85	.013 5342 5739	8 37.2
24	22 39 13.93 19.52	10 08 09.0 104.6	7.24	0.85	.012 9603 5809	8 33.6
25	22 39 33.45 19.26	10 06 24.4 103.0	7.25	0.85	.012 3794 5877	8 29.9
26	22 39 52.71 +19.01	-10 04 41.4 +101.5	7.26	0.86	I.011 7917 -5946	8 26.3
27	22 40 11.72 18.75	10 02 59.9 99.8	7.27	0.86	.011 1971 6012	8 22.7
28	22 40 30.47 18.48	10 01 20.1 98.3	7.28	0.86	.010 5959 6079	8 19.1
29	22 40 48.95 18.21	9 59 41.8 96.6	7.29	0.86	.009 9880 6143	8 15.5
30	22 41 07.16 17.94	9 58 05.2 94.9	7.30	0.86	.009 3737 6206	8 11.8
May 1	22 41 25.10 +17.67	-9 56 30.3 +93.3	7.31	0.86	I.008 7531 -6269	8 08.2
2	22 41 42.77 17.38	9 54 57.0 91.5	7.32	0.86	.008 1262 6329	8 04.6
3	22 42 00.15 17.11	9 53 25.5 89.8	7.33	0.86	.007 4933 6388	8 00.9
4	22 42 17.26 16.81	9 51 55.7 88.0	7.34	0.87	.006 8545 6445	7 57.2
5	22 42 34.07 16.53	9 50 27.7 86.3	7.35	0.87	.006 2100 6502	7 53.6
6	22 42 50.60 +16.24	-9 49 01.4 +84.4	7.36	0.87	I.005 5598 -6556	7 49.9
7	22 43 06.84 15.94	9 47 37.0 82.7	7.37	0.87	.004 9042 6610	7 46.3
8	22 43 22.78 15.65	9 46 14.3 80.8	7.39	0.87	.004 2432 6662	7 42.6
9	22 43 38.43 15.34	9 44 53.5 79.0	7.40	0.87	.003 5770 6713	7 38.9
10	22 43 53.77 15.04	9 43 34.5 77.1	7.41	0.87	.002 9057 6762	7 35.3
11	22 44 08.81 +14.74	-9 42 17.4 +75.2	7.42	0.87	I.002 2295 -6809	7 31.6
12	22 44 23.55 14.43	9 41 02.2 73.2	7.43	0.88	.001 5486 6855	7 27.9
13	22 44 37.98 14.11	9 39 49.0 71.4	7.44	0.88	.000 8631 6899	7 24.2
14	22 44 52.09 13.81	9 38 37.6 69.5	7.45	0.88	I.000 1732 6942	7 20.5
15	22 45 05.90 13.49	9 37 28.1 67.5	7.47	0.88	0.999 4790 6985	7 16.8
16	22 45 19.39 +13.17	-9 36 20.6 +65.6	7.48	0.88	0.998 7805 -7025	7 13.1
17	22 45 32.56	9 35 15.0	7.49	0.88	0.998 0780	7 09.4

SATURN, 1935

219

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
	^h ^m ^s	[°] ['] ^{''}				^h ^m
May 17	22 45 32.56 ^{+12.85}	- 9 35 15.0 ^{+63.6}	7.49	0.88	0.998 0780 ⁻⁷⁰⁶⁴	7 09.4
18	22 45 45.41 ^{12.53}	9 34 11.4 ^{61.7}	7.50	0.88	.997 3716 ⁷¹⁰²	7 05.7
19	22 45 57.94 ^{12.20}	9 33 09.7 ^{59.6}	7.51	0.89	.996 6614 ⁷¹³⁷	7 01.9
20	22 46 10.14 ^{11.88}	9 32 10.1 ^{57.5}	7.53	0.89	.995 9477 ⁷¹⁷¹	6 58.2
21	22 46 22.02 ^{11.54}	9 31 12.6 ^{55.5}	7.54	0.89	.995 2306 ⁷²⁰⁴	6 54.5
22	22 46 33.56 ^{+11.21}	- 9 30 17.1 ^{+53.5}	7.55	0.89	0.994 5102 ⁻⁷²³⁵	6 50.7
23	22 46 44.77 ^{10.88}	9 29 23.6 ^{51.4}	7.56	0.89	.993 7867 ⁷²⁶⁵	6 47.0
24	22 46 55.65 ^{10.54}	9 28 32.2 ^{49.4}	7.58	0.89	.993 0602 ⁷²⁹⁴	6 43.2
25	22 47 06.19 ^{10.20}	9 27 42.8 ^{47.2}	7.59	0.89	.992 3308 ⁷³²¹	6 39.4
26	22 47 16.39 ^{9.85}	9 26 55.6 ^{45.1}	7.60	0.90	.991 5987 ⁷³⁴⁵	6 35.7
27	22 47 26.24 ^{+9.51}	- 9 26 10.5 ^{+42.9}	7.62	0.90	0.990 8642 ⁻⁷³⁶⁹	6 31.9
28	22 47 35.75 ^{9.16}	9 25 27.6 ^{40.8}	7.63	0.90	.990 1273 ⁷³⁹⁰	6 28.2
29	22 47 44.91 ^{8.81}	9 24 46.8 ^{38.6}	7.64	0.90	.989 3883 ⁷⁴¹⁰	6 24.4
30	22 47 53.72 ^{8.46}	9 24 08.2 ^{36.4}	7.66	0.90	.988 6473 ⁷⁴²⁷	6 20.6
31	22 48 02.18 ^{8.10}	9 23 31.8 ^{34.3}	7.67	0.90	.987 9046 ⁷⁴⁴³	6 16.8
June 1	22 48 10.28 ^{+7.74}	- 9 22 57.5 ^{+32.0}	7.68	0.90	0.987 1603 ⁻⁷⁴⁵⁶	6 13.0
2	22 48 18.02 ^{7.39}	9 22 25.5 ^{29.8}	7.69	0.91	.986 4147 ⁷⁴⁶⁸	6 09.2
3	22 48 25.41 ^{7.02}	9 21 55.7 ^{27.6}	7.71	0.91	.985 6679 ⁷⁴⁷⁷	6 05.4
4	22 48 32.43 ^{6.67}	9 21 28.1 ^{25.4}	7.72	0.91	.984 9202 ⁷⁴⁸⁴	6 01.5
5	22 48 39.10 ^{6.30}	9 21 02.7 ^{23.1}	7.73	0.91	.984 1718 ⁷⁴⁸⁸	5 57.7
6	22 48 45.40 ^{+5.94}	- 9 20 39.6 ^{+20.9}	7.75	0.91	0.983 4230 ⁻⁷⁴⁹²	5 53.9
7	22 48 51.34 ^{5.57}	9 20 18.7 ^{18.7}	7.76	0.92	.982 6738 ⁷⁴⁹³	5 50.1
8	22 48 56.91 ^{5.21}	9 20 00.0 ^{16.4}	7.77	0.92	.981 9245 ⁷⁴⁹²	5 46.2
9	22 49 02.12 ^{4.83}	9 19 43.6 ^{14.2}	7.79	0.92	.981 1753 ⁷⁴⁸⁸	5 42.4
10	22 49 06.95 ^{4.47}	9 19 29.4 ^{12.0}	7.80	0.92	.980 4265 ⁷⁴⁸³	5 38.5
11	22 49 11.42 ^{+4.11}	- 9 19 17.4 ^{+9.7}	7.81	0.92	0.979 6782 ⁻⁷⁴⁷⁶	5 34.7
12	22 49 15.53 ^{3.73}	9 19 07.7 ^{7.4}	7.83	0.92	.978 9306 ⁷⁴⁶⁷	5 30.8
13	22 49 19.26 ^{3.37}	9 19 00.3 ^{5.2}	7.84	0.92	.978 1839 ⁷⁴⁵⁶	5 26.9
14	22 49 22.63 ^{3.00}	9 18 55.1 ^{3.0}	7.85	0.93	.977 4383 ⁷⁴⁴²	5 23.0
15	22 49 25.63 ^{2.62}	9 18 52.1 ^{+0.7}	7.87	0.93	.976 6941 ⁷⁴²⁸	5 19.2
16	22 49 28.25 ^{+2.26}	- 9 18 51.4 ^{-1.5}	7.88	0.93	0.975 9513 ⁻⁷⁴¹⁰	5 15.3
17	22 49 30.51 ^{1.89}	9 18 52.9 ^{3.8}	7.90	0.93	.975 2103 ⁷³⁹¹	5 11.4
18	22 49 32.40 ^{1.52}	9 18 56.7 ^{6.0}	7.91	0.93	.974 4712 ⁷³⁶⁹	5 07.5
19	22 49 33.92 ^{1.15}	9 19 02.7 ^{8.3}	7.92	0.93	.973 7343 ⁷³⁴⁶	5 03.6
20	22 49 35.07 ^{0.77}	9 19 11.0 ^{10.5}	7.94	0.94	.972 9997 ⁷³²¹	4 59.7
21	22 49 35.84 ^{+0.41}	- 9 19 21.5 ^{-12.8}	7.95	0.94	0.972 2676 ⁻⁷²⁹⁴	4 55.7
22	22 49 36.25 ^{+0.03}	9 19 34.3 ^{15.1}	7.96	0.94	.971 5382 ⁷²⁶³	4 51.8
23	22 49 36.28 ^{-0.34}	9 19 49.4 ^{17.2}	7.98	0.94	.970 8119 ⁷²³²	4 47.9
24	22 49 35.94 ^{0.71}	9 20 06.6 ^{19.5}	7.99	0.94	.970 0887 ⁷¹⁹⁷	4 43.9
25	22 49 35.23 ^{1.09}	9 20 26.1 ^{21.8}	8.00	0.94	.969 3690 ⁷¹⁶⁰	4 40.0
26	22 49 34.14 ^{-1.46}	- 9 20 47.9 ^{-24.0}	8.02	0.95	0.968 6530 ⁻⁷¹²¹	4 36.1
27	22 49 32.68 ^{1.83}	9 21 11.9 ^{26.2}	8.03	0.95	.967 9409 ⁷⁰⁸⁰	4 32.1
28	22 49 30.85 ^{2.20}	9 21 38.1 ^{28.4}	8.04	0.95	.967 2329 ⁷⁰³⁵	4 28.1
29	22 49 28.65 ^{2.57}	9 22 06.5 ^{30.6}	8.06	0.95	.966 5294 ⁶⁹⁸⁸	4 24.2
30	22 49 26.08 ^{2.94}	9 22 37.1 ^{32.8}	8.07	0.95	.965 8306 ⁶⁹⁴⁰	4 20.2
July 1	22 49 23.14 ^{-3.31}	- 9 23 09.9 ^{-35.0}	8.08	0.95	0.965 1366 ⁻⁶⁸⁸⁷	4 16.2
2	22 49 19.83	- 9 23 44.9	8.09	0.95	0.964 4479	4 12.2

SATURN, 1935

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
July 1	^{h m s} 22 49 23.14 — 3.31	^{° ′ ″} — 9 23 09.9 — 35.0	8.08	0.95	0.965 1366 — 6887	^{h m} 4 16.2
2	22 49 19.83 — 3.67	9 23 44.9 — 37.1	8.09	0.95	.964 4479 — 6834	4 12.2
3	22 49 16.16 — 4.04	9 24 22.0 — 39.3	8.11	0.96	.963 7645 — 6777	4 08.2
4	22 49 12.12 — 4.39	9 25 01.3 — 41.5	8.12	0.96	.963 0868 — 6718	4 04.2
5	22 49 07.73 — 4.76	9 25 42.8 — 43.5	8.13	0.96	.962 4150 — 6656	4 00.2
6	22 49 02.97 — 5.11	— 9 26 26.3 — 45.6	8.14	0.96	0.961 7494 — 6593	3 56.2
7	22 48 57.86 — 5.47	9 27 11.9 — 47.6	8.16	0.96	.961 0901 — 6527	3 52.2
8	22 48 52.39 — 5.81	9 27 59.5 — 49.7	8.17	0.96	.960 4374 — 6458	3 48.2
9	22 48 46.58 — 6.17	9 28 49.2 — 51.6	8.18	0.96	.959 7916 — 6387	3 44.1
10	22 48 40.41 — 6.51	9 29 40.8 — 53.7	8.19	0.96	.959 1529 — 6315	3 40.1
11	22 48 33.90 — 6.85	— 9 30 34.5 — 55.6	8.20	0.97	0.958 5214 — 6240	3 36.1
12	22 48 27.05 — 7.19	9 31 30.1 — 57.6	8.22	0.97	.957 8974 — 6162	3 32.0
13	22 48 19.86 — 7.53	9 32 27.7 — 59.5	8.23	0.97	.957 2812 — 6084	3 28.0
14	22 48 12.33 — 7.86	9 33 27.2 — 61.4	8.24	0.97	.956 6728 — 6002	3 23.9
15	22 48 04.47 — 8.19	9 34 28.6 — 63.2	8.25	0.97	.956 0726 — 5919	3 19.8
16	22 47 56.28 — 8.51	— 9 35 31.8 — 65.1	8.26	0.97	0.955 4807 — 5833	3 15.8
17	22 47 47.77 — 8.83	9 36 36.9 — 66.9	8.27	0.98	.954 8974 — 5746	3 11.7
18	22 47 38.94 — 9.16	9 37 43.8 — 68.7	8.28	0.98	.954 3228 — 5655	3 07.6
19	22 47 29.78 — 9.47	9 38 52.5 — 70.4	8.29	0.98	.953 7573 — 5563	3 03.5
20	22 47 20.31 — 9.78	9 40 02.9 — 72.2	8.31	0.98	.953 2010 — 5468	2 59.4
21	22 47 10.53 — 10.09	— 9 41 15.1 — 73.9	8.32	0.98	0.952 6542 — 5372	2 55.3
22	22 47 00.44 — 10.40	9 42 29.0 — 75.6	8.33	0.98	.952 1170 — 5274	2 51.2
23	22 46 50.04 — 10.69	9 43 44.6 — 77.2	8.34	0.98	.951 5896 — 5173	2 47.1
24	22 46 39.35 — 10.99	9 45 01.8 — 78.8	8.35	0.98	.951 0723 — 5070	2 43.0
25	22 46 28.36 — 11.28	9 46 20.6 — 80.3	8.36	0.99	.950 5653 — 4964	2 38.9
26	22 46 17.08 — 11.57	— 9 47 40.9 — 82.0	8.37	0.99	0.950 0689 — 4857	2 34.8
27	22 46 05.51 — 11.85	9 49 02.9 — 83.4	8.38	0.99	.949 5832 — 4746	2 30.7
28	22 45 53.66 — 12.12	9 50 26.3 — 84.9	8.38	0.99	.949 1086 — 4633	2 26.5
29	22 45 41.54 — 12.39	9 51 51.2 — 86.3	8.39	0.99	.948 6453 — 4520	2 22.4
30	22 45 29.15 — 12.65	9 53 17.5 — 87.6	8.40	0.99	.948 1933 — 4403	2 18.3
31	22 45 16.50 — 12.90	— 9 54 45.1 — 89.0	8.41	0.99	0.947 7530 — 4285	2 14.1
Aug. 1	22 45 03.60 — 13.16	9 56 14.1 — 90.2	8.42	0.99	.947 3245 — 4164	2 10.0
2	22 44 50.44 — 13.39	9 57 44.3 — 91.5	8.43	0.99	.946 9081 — 4043	2 05.8
3	22 44 37.05 — 13.64	9 59 15.8 — 92.7	8.43	0.99	.946 5038 — 3919	2 01.7
4	22 44 23.41 — 13.86	10 00 48.5 — 93.8	8.44	0.99	.946 1119 — 3793	1 57.5
5	22 44 09.55 — 14.09	— 10 02 22.3 — 94.9	8.45	1.00	0.945 7326 — 3666	1 53.4
6	22 43 55.46 — 14.30	10 03 57.2 — 95.9	8.46	1.00	.945 3660 — 3538	1 49.2
7	22 43 41.16 — 14.51	10 05 33.1 — 96.9	8.46	1.00	.945 0122 — 3408	1 45.0
8	22 43 26.65 — 14.71	10 07 10.0 — 97.8	8.47	1.00	.944 6714 — 3276	1 40.9
9	22 43 11.94 — 14.90	10 08 47.8 — 98.7	8.48	1.00	.944 3438 — 3144	1 36.7
10	22 42 57.04 — 15.09	— 10 10 26.5 — 99.6	8.48	1.00	0.944 0294 — 3010	1 32.5
11	22 42 41.95 — 15.26	10 12 06.1 — 100.4	8.49	1.00	.943 7284 — 2874	1 28.3
12	22 42 26.69 — 15.44	10 13 46.5 — 101.1	8.49	1.00	.943 4410 — 2738	1 24.1
13	22 42 11.25 — 15.60	10 15 27.6 — 101.8	8.50	1.00	.943 1672 — 2601	1 19.9
14	22 41 55.65 — 15.76	10 17 09.4 — 102.4	8.51	1.00	.942 9071 — 2462	1 15.7
15	22 41 39.89 — 15.90	— 10 18 51.8 — 103.1	8.51	1.00	0.942 6609 — 2321	1 11.6
16	22 41 23.99 — 16.03	— 10 20 34.9 — 103.8	8.51	1.00	0.942 4288 — 2180	1 07.4

SATURN, 1935

221

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
	^h ^m ^s	[°] ['] ["]	[°]	["]		^h ^m
Aug. 16	22 41 23.99 ^{-16.04}	-10 20 34.9 ^{-103.7}	8.51	1.00	0.942 4288 ⁻²¹⁸⁰	1 07.4
17	22 41 07.95 ^{16.18}	10 22 18.6 ^{104.1}	8.52	1.00	.942 2108 ²⁰³⁹	1 03.2
18	22 40 51.77 ^{16.30}	10 24 02.7 ^{104.6}	8.52	1.00	.942 0069 ¹⁸⁹⁵	0 59.0
19	22 40 35.47 ^{16.42}	10 25 47.3 ^{105.0}	8.53	1.01	.941 8174 ¹⁷⁵²	0 54.8
20	22 40 19.05 ^{16.54}	10 27 32.3 ^{105.4}	8.53	1.01	.941 6422 ¹⁶⁰⁷	0 50.6
21	22 40 02.51 ^{-16.63}	-10 29 17.7 ^{-105.7}	8.53	1.01	0.941 4815 ⁻¹⁴⁶¹	0 46.3
22	22 39 45.88 ^{16.73}	10 31 03.4 ^{105.9}	8.54	1.01	.941 3354 ¹³¹⁴	0 42.1
23	22 39 29.15 ^{16.82}	10 32 49.3 ^{106.1}	8.54	1.01	.941 2040 ¹¹⁶⁵	0 37.9
24	22 39 12.33 ^{16.89}	10 34 35.4 ^{106.2}	8.54	1.01	.941 0875 ¹⁰¹⁷	0 33.7
25	22 38 55.44 ^{16.96}	10 36 21.6 ^{106.3}	8.54	1.01	.940 9858 ⁸⁶⁷	0 29.5
26	22 38 38.48 ^{-17.01}	-10 38 07.9 ^{-106.3}	8.54	1.01	0.940 8991 ⁻⁷¹⁸	0 25.3
27	22 38 21.47 ^{17.07}	10 39 54.2 ^{106.3}	8.55	1.01	.940 8273 ⁵⁶⁷	0 21.1
28	22 38 04.40 ^{17.10}	10 41 40.5 ^{106.2}	8.55	1.01	.940 7706 ⁴¹⁷	0 16.9
29	22 37 47.30 ^{17.13}	10 43 26.7 ^{106.1}	8.55	1.01	.940 7289 ²⁶⁵	0 12.7
30	22 37 30.17 ^{17.15}	10 45 12.8 ^{105.8}	8.55	1.01	.940 7023 ⁻¹¹⁴	0 08.4
31	22 37 13.02 ^{-17.16}	-10 46 58.6 ^{-105.5}	8.55	1.01	0.940 6909 ⁺³⁶	0 04.2
Sept. 1	22 36 55.86 ^{17.16}	10 48 44.1 ^{105.3}	8.55	1.01	.940 6945 ¹⁸⁸	{ 0 00.0 } { 23 55.8 }
2	22 36 38.70 ^{17.16}	10 50 29.4 ^{104.8}	8.55	1.01	.940 7133 ³³⁹	23 51.6
3	22 36 21.54 ^{17.13}	10 52 14.2 ^{104.5}	8.55	1.01	.940 7472 ⁴⁹⁰	23 47.4
4	22 36 04.41 ^{17.11}	10 53 58.7 ^{103.9}	8.55	1.01	.940 7962 ⁶⁴⁰	23 43.1
5	22 35 47.30 ^{-17.07}	-10 55 42.6 ^{-103.4}	8.55	1.01	0.940 8602 ⁺⁷⁹¹	23 38.9
6	22 35 30.23 ^{17.03}	10 57 26.0 ^{102.8}	8.54	1.01	.940 9393 ⁹⁴¹	23 34.7
7	22 35 13.20 ^{16.98}	10 59 08.8 ^{102.1}	8.54	1.01	.941 0334 ¹⁰⁹⁰	23 30.5
8	22 34 56.22 ^{16.91}	11 00 50.9 ^{101.4}	8.54	1.01	.941 1424 ¹²³⁹	23 26.3
9	22 34 39.31 ^{16.83}	11 02 32.3 ^{100.7}	8.54	1.01	.941 2663 ¹³⁸⁷	23 22.1
10	22 34 22.48 ^{-16.76}	-11 04 13.0 ^{-99.9}	8.54	1.01	0.941 4050 ⁺¹⁵³³	23 17.9
11	22 34 05.72 ^{16.66}	11 05 52.9 ^{99.1}	8.53	1.01	.941 5583 ¹⁶⁸⁰	23 13.7
12	22 33 49.06 ^{16.57}	11 07 32.0 ^{98.2}	8.53	1.01	.941 7263 ¹⁸²⁵	23 09.5
13	22 33 32.49 ^{16.47}	11 09 10.2 ^{97.2}	8.53	1.01	.941 9088 ¹⁹⁶⁹	23 05.2
14	22 33 16.02 ^{16.35}	11 10 47.4 ^{96.3}	8.52	1.00	.942 1057 ²¹¹⁴	23 01.0
15	22 32 59.67 ^{-16.23}	-11 12 23.7 ^{-95.3}	8.52	1.00	0.942 3171 ⁺²²⁵⁷	22 56.8
16	22 32 43.44 ^{16.10}	11 13 59.0 ^{94.2}	8.51	1.00	.942 5428 ²⁴⁰⁰	22 52.6
17	22 32 27.34 ^{15.96}	11 15 33.2 ^{93.0}	8.51	1.00	.942 7828 ²⁵⁴¹	22 48.5
18	22 32 11.38 ^{15.82}	11 17 06.2 ^{91.9}	8.50	1.00	.943 0369 ²⁶⁸³	22 44.3
19	22 31 55.56 ^{15.65}	11 18 38.1 ^{90.6}	8.50	1.00	.943 3052 ²⁸²²	22 40.1
20	22 31 39.91 ^{-15.50}	-11 20 08.7 ^{-89.5}	8.49	1.00	0.943 5874 ⁺²⁹⁶¹	22 35.9
21	22 31 24.41 ^{15.32}	11 21 38.2 ^{88.1}	8.49	1.00	.943 8835 ³⁰⁹⁸	22 31.7
22	22 31 09.09 ^{15.14}	11 23 06.3 ^{86.8}	8.48	1.00	.944 1933 ³²³⁴	22 27.5
23	22 30 53.95 ^{14.95}	11 24 33.1 ^{85.4}	8.47	1.00	.944 5167 ³³⁶⁹	22 23.3
24	22 30 39.00 ^{14.75}	11 25 58.5 ^{84.0}	8.47	1.00	.944 8536 ³⁵⁰²	22 19.1
25	22 30 24.25 ^{-14.55}	-11 27 22.5 ^{-82.4}	8.46	1.00	0.945 2038 ⁺³⁶³⁴	22 15.0
26	22 30 09.70 ^{14.33}	11 28 44.9 ^{81.0}	8.45	1.00	.945 5672 ³⁷⁶⁴	22 10.8
27	22 29 55.37 ^{14.11}	11 30 05.9 ^{79.3}	8.45	1.00	.945 9436 ³⁸⁹³	22 06.7
28	22 29 41.26 ^{13.88}	11 31 25.2 ^{77.8}	8.44	0.99	.946 3329 ⁴⁰²⁰	22 02.5
29	22 29 27.38 ^{13.64}	11 32 43.0 ^{76.1}	8.43	0.99	.946 7349 ⁴¹⁴⁵	21 58.3
30	22 29 13.74 ^{-13.40}	-11 33 59.1 ^{-74.4}	8.42	0.99	0.947 1494 ⁺⁴²⁶⁹	21 54.2
Oct. 1	22 29 00.34	-11 35 13.5	8.41	0.99	0.947 5763	21 50.0

SATURN, 1935

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Oct. 1	^{h m s} 22 29 00.34 ^s	^{° ' "} -11 35 13.5 ^s	8.41	0.99	0.947 5763	^{h m} 21 50.0
2	22 28 47.19 ^s	11 36 26.2 ^s	8.41	0.99	.948 0153 ⁺⁴³⁹⁰	21 45.9
3	22 28 34.31 ^s	11 37 37.1 ^s	8.40	0.99	.948 4662 ⁴⁵⁰⁹	21 41.7
4	22 28 21.69 ^s	11 38 46.3 ^s	8.39	0.99	.948 9288 ⁴⁶²⁶	21 37.6
5	22 28 09.35 ^s	11 39 53.7 ^s	8.38	0.99	.949 4029 ⁴⁷⁴¹	21 33.5
6	22 27 57.29 ^s	-11 40 59.2 ^s	8.37	0.99	0.949 8882 ⁺⁴⁸⁵³	21 29.3
7	22 27 45.51 ^s	11 42 02.8 ^s	8.36	0.99	.950 3846 ⁺⁴⁹⁶⁴	21 25.2
8	22 27 34.02 ^s	11 43 04.5 ^s	8.35	0.99	.950 8918 ⁵⁰⁷²	21 21.1
9	22 27 22.83 ^s	11 44 04.2 ^s	8.34	0.98	.951 4096 ⁵¹⁷⁸	21 17.0
10	22 27 11.95 ^s	11 45 02.0 ^s	8.33	0.98	.951 9379 ⁵²⁸³	21 12.9
11	22 27 01.37 ^s	-11 45 57.9 ^s	8.32	0.98	0.952 4763 ⁵³⁸⁴	21 08.8
12	22 26 51.11 ^s	11 46 51.7 ^s	8.31	0.98	.953 0246 ⁺⁵⁴⁸³	21 04.7
13	22 26 41.16 ^s	11 47 43.6 ^s	8.30	0.98	.953 5826 ⁵⁵⁸⁰	21 00.6
14	22 26 31.53 ^s	11 48 33.4 ^s	8.29	0.98	.954 1502 ⁵⁶⁷⁶	20 56.5
15	22 26 22.23 ^s	11 49 21.1 ^s	8.28	0.98	.954 7271 ⁵⁷⁶⁹	20 52.4
16	22 26 13.26 ^s	-11 50 06.7 ^s	8.27	0.97	0.955 3130 ⁺⁵⁸⁵⁹	20 48.3
17	22 26 04.62 ^s	11 50 50.3 ^s	8.25	0.97	.955 9078 ⁺⁵⁹⁴⁸	20 44.3
18	22 25 56.33 ^s	11 51 31.7 ^s	8.24	0.97	.956 5112 ⁶⁰³⁴	20 40.2
19	22 25 48.38 ^s	11 52 11.0 ^s	8.23	0.97	.957 1231 ⁶¹¹⁹	20 36.2
20	22 25 40.78 ^s	11 52 48.1 ^s	8.22	0.97	.957 7432 ⁶²⁰¹	20 32.1
21	22 25 33.54 ^s	-11 53 23.1 ^s	8.21	0.97	0.958 3712 ⁺⁶²⁸⁰	20 28.0
22	22 25 26.65 ^s	11 53 55.9 ^s	8.20	0.96	.959 0071 ⁺⁶³⁵⁹	20 24.0
23	22 25 20.13 ^s	11 54 26.4 ^s	8.18	0.96	.959 6504 ⁶⁴³³	20 20.0
24	22 25 13.97 ^s	11 54 54.6 ^s	8.17	0.96	.960 3010 ⁶⁵⁰⁶	20 16.0
25	22 25 08.18 ^s	11 55 20.6 ^s	8.16	0.96	.960 9586 ⁶⁵⁷⁶	20 11.9
26	22 25 02.77 ^s	-11 55 44.4 ^s	8.15	0.96	0.961 6229 ⁺⁶⁶⁴³	20 07.9
27	22 24 57.73 ^s	11 56 05.9 ^s	8.13	0.96	.962 2937 ⁺⁶⁷⁰⁸	20 03.9
28	22 24 53.07 ^s	11 56 25.1 ^s	8.12	0.96	.962 9706 ⁶⁷⁶⁹	19 59.9
29	22 24 48.79 ^s	11 56 42.0 ^s	8.11	0.96	.963 6535 ⁶⁸²⁹	19 55.9
30	22 24 44.90 ^s	11 56 56.6 ^s	8.10	0.95	.964 3420 ⁶⁸⁸⁵	19 51.9
31	22 24 41.40 ^s	-11 57 08.9 ^s	8.08	0.95	0.965 0359 ⁺⁶⁹³⁹	19 47.9
Nov. 1	22 24 38.29 ^s	11 57 18.8 ^s	8.07	0.95	.965 7350 ⁺⁶⁹⁹¹	19 43.9
2	22 24 35.57 ^s	11 57 26.4 ^s	8.06	0.95	.966 4389 ⁷⁰³⁹	19 40.0
3	22 24 33.24 ^s	11 57 31.6 ^s	8.04	0.95	.967 1475 ⁷⁰⁸⁶	19 36.0
4	22 24 31.30 ^s	11 57 34.6 ^s	8.03	0.95	.967 8604 ⁷¹²⁹	19 32.0
5	22 24 29.76 ^s	-11 57 35.2 ^s	8.02	0.95	0.968 5774 ⁺⁷¹⁷⁰	19 28.1
6	22 24 28.62 ^s	11 57 33.5 ^s	8.00	0.94	.969 2983 ⁺⁷²⁰⁹	19 24.1
7	22 24 27.87 ^s	11 57 29.6 ^s	7.99	0.94	.970 0227 ⁷²⁴⁴	19 20.2
8	22 24 27.51 ^s	11 57 23.3 ^s	7.98	0.94	.970 7504 ⁷²⁷⁷	19 16.3
9	22 24 27.56 ^s	11 57 14.6 ^s	7.96	0.94	.971 4812 ⁷³⁰⁸	19 12.3
10	22 24 28.00 ^s	-11 57 03.7 ^s	7.95	0.94	0.972 2148 ⁺⁷³³⁶	19 08.4
11	22 24 28.84 ^s	11 56 50.4 ^s	7.94	0.94	.972 9510 ⁺⁷³⁶²	19 04.5
12	22 24 30.08 ^s	11 56 34.8 ^s	7.92	0.93	.973 6896 ⁷³⁸⁶	19 00.6
13	22 24 31.71 ^s	11 56 16.9 ^s	7.91	0.93	.974 4304 ⁷⁴⁰⁸	18 56.7
14	22 24 33.74 ^s	11 55 56.7 ^s	7.90	0.93	.975 1731 ⁷⁴²⁷	18 52.8
15	22 24 36.17 ^s	-11 55 34.2 ^s	7.88	0.93	0.975 9176 ⁺⁷⁴⁴⁵	18 48.9
16	22 24 38.99 ^s	11 55 09.4 ^s	7.87	0.93	0.976 6636 ⁺⁷⁴⁶⁰	18 45.1

SATURN, 1935

223

Date	Apparent Right Ascension	Apparent Declination	Polar S.D.	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Nov. 16	^{h m s} 22 24 38.99 + 3.22	^{° ' "} -11 55 09.4 + 27.1	7.87	0.93	0.976 6636	^{h m} 18 45.1
17	22 24 42.21 + 3.62	11 54 42.3 + 29.4	7.86	0.93	.977 4109 +7473	18 41.2
18	22 24 45.83 4.01	11 54 12.9 31.6	7.84	0.92	.978 1593 7484	18 37.3
19	22 24 49.84 4.40	11 53 41.3 34.0	7.83	0.92	.978 9085 7492	18 33.5
20	22 24 54.24 4.81	11 53 07.3 36.3	7.81	0.92	.979 6582 7497	18 29.6
21	22 24 59.05 + 5.20	-11 52 31.0 + 38.5	7.80	0.92	0.980 4083 +7502	18 25.7
22	22 25 04.25 5.60	11 51 52.5 40.7	7.79	0.92	.981 1585 7501	18 21.9
23	22 25 09.85 5.99	11 51 11.8 43.1	7.77	0.92	.981 9086 7497	18 18.1
24	22 25 15.84 6.39	11 50 28.7 45.3	7.76	0.92	.982 6583 7491	18 14.2
25	22 25 22.23 6.77	11 49 43.4 47.5	7.75	0.91	.983 4074 7482	18 10.4
26	22 25 29.00 + 7.16	-11 48 55.9 + 49.8	7.73	0.91	0.984 1556 +7472	18 06.6
27	22 25 36.16 7.55	11 48 06.1 51.9	7.72	0.91	.984 9028 7459	18 02.8
28	22 25 43.71 7.94	11 47 14.2 54.2	7.71	0.91	.985 6487 7443	17 59.0
29	22 25 51.65 8.32	11 46 20.0 56.4	7.69	0.91	.986 3930 7426	17 55.2
30	22 25 59.97 8.69	11 45 23.6 58.5	7.68	0.90	.987 1356 7407	17 51.4
Dec. 1	22 26 08.66 + 9.07	-11 44 25.1 + 60.7	7.67	0.90	0.987 8763 +7385	17 47.6
2	22 26 17.73 9.45	11 43 24.4 62.9	7.66	0.90	.988 6148 7361	17 43.9
3	22 26 27.18 9.83	11 42 21.5 64.9	7.64	0.90	.989 3509 7336	17 40.1
4	22 26 37.01 10.19	11 41 16.6 67.1	7.63	0.90	.990 0845 7308	17 36.3
5	22 26 47.20 10.55	11 40 09.5 69.1	7.62	0.90	.990 8153 7278	17 32.6
6	22 26 57.75 +10.93	-11 39 00.4 + 71.2	7.60	0.90	0.991 5431 +7246	17 28.8
7	22 27 08.68 11.28	11 37 49.2 73.2	7.59	0.89	.992 2677 7212	17 25.0
8	22 27 19.96 11.64	11 36 36.0 75.3	7.58	0.89	.992 9889 7178	17 21.3
9	22 27 31.60 11.99	11 35 20.7 77.3	7.57	0.89	.993 7067 7141	17 17.6
10	22 27 43.59 12.34	11 34 03.4 79.3	7.55	0.89	.994 4208 7103	17 13.9
11	22 27 55.93 +12.70	-11 32 44.1 + 81.3	7.54	0.89	0.995 1311 +7064	17 10.1
12	22 28 08.63 13.03	11 31 22.8 83.2	7.53	0.89	.995 8375 7021	17 06.4
13	22 28 21.66 13.38	11 29 59.6 85.2	7.52	0.89	.996 5396 6978	17 02.7
14	22 28 35.04 13.72	11 28 34.4 87.2	7.51	0.88	.997 2374 6933	16 59.0
15	22 28 48.76 14.05	11 27 07.2 89.0	7.49	0.88	.997 9307 6887	16 55.3
16	22 29 02.81 +14.39	-11 25 38.2 + 90.9	7.48	0.88	0.998 6194 +6838	16 51.6
17	22 29 17.20 14.72	11 24 07.3 92.9	7.47	0.88	.999 3032 6788	16 47.9
18	22 29 31.92 15.04	11 22 34.4 94.7	7.46	0.88	0.999 9820 6737	16 44.2
19	22 29 46.96 15.37	11 20 59.7 96.6	7.45	0.88	1.000 6557 6684	16 40.5
20	22 30 02.33 15.69	11 19 23.1 98.4	7.43	0.88	.001 3241 6629	16 36.9
21	22 30 18.02 +16.00	-11 17 44.7 +100.3	7.42	0.88	1.001 9870 +6574	16 33.2
22	22 30 34.02 16.32	11 16 04.4 102.0	7.41	0.87	.002 6444 6516	16 29.5
23	22 30 50.34 16.63	11 14 22.4 103.8	7.40	0.87	.003 2960 6456	16 25.9
24	22 31 06.97 16.93	11 12 38.6 105.5	7.39	0.87	.003 9416 6395	16 22.3
25	22 31 23.90 17.24	11 10 53.1 107.2	7.38	0.87	.004 5811 6332	16 18.6
26	22 31 41.14 +17.53	-11 09 05.9 +109.0	7.37	0.87	1.005 2143 +6268	16 15.0
27	22 31 58.67 17.83	11 07 16.9 110.7	7.36	0.87	.005 8411 6201	16 11.3
28	22 32 16.50 18.12	11 05 26.2 112.3	7.35	0.87	.006 4612 6135	16 07.7
29	22 32 34.62 18.41	11 03 33.9 114.0	7.34	0.86	.007 0747 6065	16 04.1
30	22 32 53.03 18.68	11 01 39.9 115.6	7.33	0.86	.007 6812 5996	16 00.4
31	22 33 11.71 +18.96	-10 59 44.3 +117.1	7.32	0.86	1.008 2808 +5925	15 56.8
32	22 33 30.67 19.24	10 57 47.2 118.7	7.31	0.86	1.008 8733 5859	15 53.2

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Jan. 1	^h 1 ^m 42 ^s 56.22 [°] - 1.02	+10° 05' 10.6" - 3.5	1.75	0.45	I.290 8546	^h 19 ^m 00.9
2	1 42 55.20 0.82	10 05 07.1 - 2.5	1.75	0.45	.291 2191 +3645	18 57.0
3	1 42 54.38 0.62	10 05 04.6 1.3	1.75	0.45	.291 5853 3662	18 53.0
4	1 42 53.76 0.42	10 05 03.3 - 0.2	1.75	0.45	.291 9530 3677	18 49.1
5	1 42 53.34 0.23	10 05 03.1 + 0.9	1.75	0.45	.292 3221 3691	18 45.2
6	1 42 53.11 - 0.02	+10 05 04.0 + 2.0	1.75	0.45	I.292 6926	18 41.2
7	1 42 53.09 + 0.18	10 05 06.0 3.2	1.75	0.45	.293 0642 +3716	18 37.3
8	1 42 53.27 0.37	10 05 09.2 4.3	1.74	0.45	.293 4368 3726	18 33.4
9	1 42 53.64 0.57	10 05 13.5 5.5	1.74	0.45	.293 8103 3735	18 29.5
10	1 42 54.21 0.77	10 05 19.0 6.6	1.74	0.45	.294 1847 3744	18 25.5
11	1 42 54.98 + 0.97	+10 05 25.6 + 7.8	1.74	0.45	I.294 5597	18 21.6
12	1 42 55.95 1.17	10 05 33.4 8.8	1.74	0.45	.294 9352 +3755	18 17.7
13	1 42 57.12 1.37	10 05 42.2 10.0	1.74	0.45	.295 3111 3759	18 13.8
14	1 42 58.49 1.57	10 05 52.2 11.1	1.74	0.45	.295 6873 3762	18 09.9
15	1 43 00.06 1.76	10 06 03.3 12.2	1.73	0.45	.296 0637 3764	18 06.0
16	1 43 01.82 + 1.96	+10 06 15.5 +13.3	1.73	0.44	I.296 4401	18 02.1
17	1 43 03.78 2.16	10 06 28.8 14.5	1.73	0.44	.296 8164 +3763	17 58.2
18	1 43 05.94 2.36	10 06 43.3 15.5	1.73	0.44	.297 1926 3762	17 54.3
19	1 43 08.30 2.55	10 06 58.8 16.7	1.73	0.44	.297 5684 3758	17 50.4
20	1 43 10.85 2.74	10 07 15.5 17.7	1.73	0.44	.297 9439 3755	17 46.5
21	1 43 13.59 + 2.94	+10 07 33.2 +18.8	1.72	0.44	I.298 3190	17 42.6
22	1 43 16.53 3.14	10 07 52.0 20.0	1.72	0.44	.298 6935 +3745	17 38.8
23	1 43 19.67 3.34	10 08 12.0 21.0	1.72	0.44	.299 0673 3738	17 34.9
24	1 43 23.01 3.52	10 08 33.0 22.1	1.72	0.44	.299 4403 3730	17 31.0
25	1 43 26.53 3.71	10 08 55.1 23.2	1.72	0.44	.299 8124 3721	17 27.1
26	1 43 30.24 + 3.90	+10 09 18.3 +24.3	1.72	0.44	I.300 1835	17 23.3
27	1 43 34.14 4.10	10 09 42.6 25.3	1.72	0.44	.300 5534 +3699	17 19.4
28	1 43 38.24 4.28	10 10 07.9 26.4	1.71	0.44	.300 9220 3686	17 15.5
29	1 43 42.52 4.47	10 10 34.3 27.5	1.71	0.44	.301 2894 3674	17 11.7
30	1 43 46.99 4.66	10 11 01.8 28.5	1.71	0.44	.301 6553 3659	17 07.8
31	1 43 51.65 + 4.85	+10 11 30.3 +29.5	1.71	0.44	I.302 0197	17 04.0
Feb. 1	1 43 56.50 5.03	10 11 59.8 30.5	1.71	0.44	.302 3824 +3627	17 00.1
2	1 44 01.53 5.22	10 12 30.3 31.6	1.71	0.44	.302 7434 3610	16 56.3
3	1 44 06.75 5.40	10 13 01.9 32.6	1.71	0.44	.303 1025 3591	16 52.4
4	1 44 12.15 5.59	10 13 34.5 33.7	1.70	0.44	.303 4595 3570	16 48.6
5	1 44 17.74 + 5.76	+10 14 08.2 +34.6	1.70	0.44	I.303 8144	16 44.8
6	1 44 23.50 5.95	10 14 42.8 35.6	1.70	0.44	.304 1672 +3528	16 40.9
7	1 44 29.45 6.12	10 15 18.4 36.6	1.70	0.44	.304 5176 3504	16 37.1
8	1 44 35.57 6.29	10 15 55.0 37.6	1.70	0.44	.304 8657 3481	16 33.3
9	1 44 41.86 6.47	10 16 32.6 38.5	1.70	0.44	.305 2112 3455	16 29.4
10	1 44 48.33 + 6.64	+10 17 11.1 +39.4	1.70	0.44	I.305 5542	16 25.6
11	1 44 54.97 6.81	10 17 50.5 40.4	1.69	0.44	.305 8945 +3403	16 21.8
12	1 45 01.78 6.98	10 18 30.9 41.3	1.69	0.43	.306 2320 3375	16 18.0
13	1 45 08.76 7.15	10 19 12.2 42.3	1.69	0.43	.306 5666 3346	16 14.1
14	1 45 15.91 7.31	10 19 54.5 43.1	1.69	0.43	.306 8983 3317	16 10.3
15	1 45 23.22 + 7.47	+10 20 37.6 +44.0	1.69	0.43	I.307 2269	16 06.5
16	1 45 30.69 7.64	+10 21 21.6 +44.0	1.69	0.43	.307 5525 +3256	16 02.7

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Feb. 16	^h 45 ^m 30.69 ^s + 7.63	+10° 21' 21.6" +44.8"	1.69	0.43	1.307 5525 +3223	^h 16 ^m 02.7
17	45 38.32 + 7.79	10 22 06.4 +45.7	1.69	0.43	307 8748 3192	15 58.9
18	45 46.11 + 7.95	10 22 52.1 +46.6	1.69	0.43	308 1940 3158	15 55.1
19	45 54.06 + 8.11	10 23 38.7 +47.4	1.68	0.43	308 5098 3124	15 51.3
20	46 02.17 + 8.26	10 24 26.1 +48.3	1.68	0.43	308 8222 3090	15 47.5
21	46 10.43 + 8.41	+10 25 14.4 +49.1	1.68	0.43	1.309 1312 +3054	15 43.7
22	46 18.84 + 8.56	10 26 03.5 +49.8	1.68	0.43	309 4366 3018	15 40.0
23	46 27.40 + 8.70	10 26 53.3 +50.7	1.68	0.43	309 7384 2981	15 36.2
24	46 36.10 + 8.85	10 27 44.0 +51.4	1.68	0.43	310 0365 2944	15 32.4
25	46 44.95 + 9.00	10 28 35.4 +52.2	1.68	0.43	310 3309 2905	15 28.6
26	46 53.95 + 9.14	+10 29 27.6 +53.0	1.68	0.43	1.310 6214 +2866	15 24.8
27	47 03.09 + 9.28	10 30 20.6 +53.7	1.68	0.43	310 9080 2826	15 21.0
28	47 12.37 + 9.42	10 31 14.3 +54.5	1.67	0.43	311 1906 2786	15 17.2
Mar. 1	47 21.79 + 9.55	10 32 08.8 +55.1	1.67	0.43	311 4692 2744	15 13.5
2	47 31.34 + 9.69	10 33 03.9 +55.9	1.67	0.43	311 7436 2703	15 09.7
3	47 41.03 + 9.82	+10 33 59.8 +56.6	1.67	0.43	1.312 0139 +2660	15 06.0
4	47 50.85 + 9.95	10 34 56.4 +57.2	1.67	0.43	312 2799 2616	15 02.2
5	48 00.80 + 10.07	10 35 53.6 +57.9	1.67	0.43	312 5415 2573	14 58.4
6	48 10.87 + 10.20	10 36 51.5 +58.5	1.67	0.43	312 7988 2527	14 54.7
7	48 21.07 + 10.32	10 37 50.0 +59.2	1.67	0.43	313 0515 2482	14 50.9
8	48 31.39 + 10.44	+10 38 49.2 +59.8	1.67	0.43	1.313 2997 +2437	14 47.1
9	48 41.83 + 10.56	10 39 49.0 +60.4	1.67	0.43	313 5434 2390	14 43.4
10	48 52.39 + 10.67	10 40 49.4 +60.9	1.66	0.43	313 7824 2342	14 39.6
11	49 03.06 + 10.78	10 41 50.3 +61.5	1.66	0.43	314 0166 2296	14 35.9
12	49 13.84 + 10.89	10 42 51.8 +62.1	1.66	0.43	314 2462 2248	14 32.1
13	49 24.73 + 11.00	+10 43 53.9 +62.6	1.66	0.43	1.314 4710 +2199	14 28.3
14	49 35.73 + 11.10	10 44 56.5 +63.1	1.66	0.43	314 6909 2151	14 24.6
15	49 46.83 + 11.21	10 45 59.6 +63.7	1.66	0.43	314 9060 2103	14 20.8
16	49 58.04 + 11.30	10 47 03.3 +64.2	1.66	0.43	315 1163 2052	14 17.1
17	50 09.34 + 11.40	10 48 07.5 +64.6	1.66	0.43	315 3215 2003	14 13.4
18	50 20.74 + 11.49	+10 49 12.1 +65.1	1.66	0.43	1.315 5218 +1953	14 09.6
19	50 32.23 + 11.58	10 50 17.2 +65.5	1.66	0.43	315 7171 1902	14 05.9
20	50 43.81 + 11.67	10 51 22.7 +66.0	1.66	0.43	315 9073 1851	14 02.1
21	50 55.48 + 11.76	10 52 28.7 +66.4	1.66	0.42	316 0924 1799	13 58.4
22	51 07.24 + 11.84	10 53 35.1 +66.8	1.65	0.42	316 2723 1749	13 54.7
23	51 19.08 + 11.93	+10 54 41.9 +67.2	1.65	0.42	1.316 4472 +1697	13 50.9
24	51 31.01 + 12.01	10 55 49.1 +67.6	1.65	0.42	316 6169 1644	13 47.2
25	51 43.02 + 12.09	10 56 56.7 +67.9	1.65	0.42	316 7813 1592	13 43.5
26	51 55.11 + 12.16	10 58 04.6 +68.3	1.65	0.42	316 9405 1539	13 39.7
27	52 07.27 + 12.23	10 59 12.9 +68.6	1.65	0.42	317 0944 1485	13 36.0
28	52 19.50 + 12.30	+11 00 21.5 +68.9	1.65	0.42	1.317 2429 +1432	13 32.3
29	52 31.80 + 12.37	11 01 30.4 +69.3	1.65	0.42	317 3861 1377	13 28.6
30	52 44.17 + 12.44	11 02 39.7 +69.5	1.65	0.42	317 5238 1324	13 24.9
31	52 56.61 + 12.49	11 03 49.2 +69.9	1.65	0.42	317 6562 1269	13 21.1
Apr. 1	53 09.10 + 12.56	11 04 59.1 +70.1	1.65	0.42	317 7831 1214	13 17.4
2	53 21.66 + 12.62	+11 06 09.2 +70.3	1.65	0.42	1.317 9045 +1158	13 13.7
3	53 34.28 + 12.62	+11 07 19.5 +70.3	1.65	0.42	1.318 0203 +1158	13 09.9

URANUS, 1935

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Apr. 1	^{h m s} I 53 09.10	^{° ′ ″} +II 04 59.1	1.65	0.42	I.317 7831	^{h m} I3 17.4
2	I 53 21.66 ^{+12.56}	II 06 09.2 ^{+70.1}	1.65	0.42	·317 9045 ⁺¹²¹⁴	I3 13.7
3	I 53 34.28 ^{12.62}	II 07 19.5 ^{70.3}	1.65	0.42	·318 0203 ¹¹⁵⁸	I3 09.9
4	I 53 46.95 ^{12.67}	II 08 30.1 ^{70.6}	1.65	0.42	·318 1307 ¹¹⁰⁴	I3 06.2
5	I 53 59.68 ^{12.73}	II 09 40.9 ^{70.8}	1.65	0.42	·318 2354 ¹⁰⁴⁷	I3 02.5
6	I 54 12.45 ^{12.77}	II 10 51.8 ^{70.9}	1.65	0.42	·318 3345 ⁹⁹¹	I2 58.8
7	I 54 25.27 ^{+12.82}	II 12 03.0 ^{+71.2}	1.65	0.42	·318 4280 ⁺⁹³⁵	I2 55.1
8	I 54 38.12 ^{12.85}	II 13 14.3 ^{71.3}	1.65	0.42	·318 5159 ⁸⁷⁹	I2 51.3
9	I 54 51.02 ^{12.90}	II 14 25.8 ^{71.5}	1.65	0.42	·318 5982 ⁸²³	I2 47.6
10	I 55 03.95 ^{12.93}	II 15 37.4 ^{71.6}	1.65	0.42	·318 6748 ⁷⁶⁶	I2 43.9
11	I 55 16.92 ^{12.97}	II 16 49.1 ^{71.7}	1.65	0.42	·318 7458 ⁷¹⁰	I2 40.2
12	I 55 29.93 ^{+13.01}	II 18 00.9 ^{+71.8}	1.65	0.42	·318 8112 ⁺⁶⁵⁴	I2 36.5
13	I 55 42.96 ^{13.03}	II 19 12.8 ^{71.9}	1.64	0.42	·318 8709 ⁵⁹⁷	I2 32.8
14	I 55 56.02 ^{13.06}	II 20 24.8 ^{72.0}	1.64	0.42	·318 9250 ⁵⁴¹	I2 29.0
15	I 56 09.10 ^{13.08}	II 21 36.8 ^{72.0}	1.64	0.42	·318 9734 ⁴⁸⁴	I2 25.3
16	I 56 22.21 ^{13.11}	II 22 48.8 ^{72.0}	1.64	0.42	I.319 0162 ⁴²⁸	I2 21.6
17	I 56 35.33 ^{+13.12}	II 24 01.0 ^{+72.2}	1.64	0.42	·319 0533 ⁺³⁷¹	I2 17.9
18	I 56 48.47 ^{13.14}	II 25 13.1 ^{72.1}	1.64	0.42	·319 0848 ³¹⁵	I2 14.2
19	I 57 01.63 ^{13.16}	II 26 25.2 ^{72.1}	1.64	0.42	·319 1106 ²⁵⁸	I2 10.5
20	I 57 14.80 ^{13.17}	II 27 37.4 ^{72.2}	1.64	0.42	·319 1308 ²⁰²	I2 06.8
21	I 57 27.97 ^{13.17}	II 28 49.5 ^{72.1}	1.64	0.42	I.319 1453 ¹⁴⁵	I2 03.0
22	I 57 41.15 ^{+13.18}	II 30 01.6 ^{+72.1}	1.64	0.42	·319 1542 ⁺⁸⁹	II 59.3
23	I 57 54.34 ^{13.19}	II 31 13.6 ^{72.0}	1.64	0.42	·319 1574 ⁺³²	II 55.6
24	I 58 07.52 ^{13.18}	II 32 25.6 ^{72.0}	1.64	0.42	·319 1550 ²⁴	II 51.9
25	I 58 20.71 ^{13.19}	II 33 37.5 ^{71.9}	1.64	0.42	·319 1469 ⁸¹	II 48.2
26	I 58 33.90 ^{13.19}	II 34 49.3 ^{71.8}	1.64	0.42	I.319 1332 ¹³⁷	II 44.5
27	I 58 47.08 ^{+13.18}	II 36 01.0 ^{+71.7}	1.64	0.42	·319 1138 ¹⁹⁴	II 40.8
28	I 59 00.26 ^{13.18}	II 37 12.6 ^{71.6}	1.64	0.42	·319 0888 ²⁵⁰	II 37.0
29	I 59 13.42 ^{13.16}	II 38 24.0 ^{71.4}	1.64	0.42	·319 0580 ³⁰⁸	II 33.3
30	I 59 26.57 ^{13.15}	II 39 35.3 ^{71.3}	1.64	0.42	·319 0216 ³⁶⁴	II 29.6
May 1	I 59 39.70 ^{13.13}	II 40 46.4 ^{71.1}	1.64	0.42	I.318 9796 ⁴²⁰	II 25.9
2	I 59 52.81 ^{+13.11}	II 41 57.4 ^{+71.0}	1.64	0.42	·318 9320 ⁴⁷⁶	II 22.2
3	2 00 05.91 ^{13.10}	II 43 08.1 ^{70.7}	1.64	0.42	·318 8787 ⁵³³	II 18.5
4	2 00 18.97 ^{13.06}	II 44 18.7 ^{70.6}	1.65	0.42	·318 8198 ⁵⁸⁹	II 14.8
5	2 00 32.01 ^{13.04}	II 45 29.0 ^{70.3}	1.65	0.42	·318 7553 ⁶⁴⁵	II 11.0
6	2 00 45.02 ^{13.01}	II 46 39.1 ^{70.1}	1.65	0.42	·318 6852 ⁷⁰¹	II 07.3
7	2 00 58.00 ^{+12.98}	II 47 49.0 ^{+69.9}	1.65	0.42	·318 6096 ⁷⁵⁶	II 03.6
8	2 01 10.94 ^{12.94}	II 48 58.6 ^{69.6}	1.65	0.42	·318 5284 ⁸¹²	IO 59.9
9	2 01 23.84 ^{12.90}	II 50 07.9 ^{69.3}	1.65	0.42	·318 4418 ⁸⁶⁶	IO 56.2
10	2 01 36.71 ^{12.87}	II 51 16.9 ^{69.0}	1.65	0.42	·318 3497 ⁹²¹	IO 52.4
11	2 01 49.53 ^{12.82}	II 52 25.5 ^{68.6}	1.65	0.42	·318 2522 ⁹⁷⁵	IO 48.7
12	2 02 02.30 ^{+12.77}	II 53 33.9 ^{+68.4}	1.65	0.42	·318 1493 ¹⁰²⁹	IO 45.0
13	2 02 15.03 ^{12.73}	II 54 42.0 ^{68.1}	1.65	0.42	·318 0410 ¹⁰⁸³	IO 41.3
14	2 02 27.70 ^{12.67}	II 55 49.7 ^{67.7}	1.65	0.42	·317 9273 ¹¹³⁷	IO 37.6
15	2 02 40.32 ^{12.62}	II 56 57.1 ^{67.4}	1.65	0.42	·317 8082 ¹¹⁹¹	IO 33.8
16	2 02 52.89 ^{12.57}	II 58 04.1 ^{67.0}	1.65	0.42	I.317 6839 ¹²⁴³	IO 30.1
17	2 03 05.40 ^{+12.51}	II 59 10.8 ^{+66.7}	1.65	0.42	I.317 5543 ¹²⁹⁶	IO 26.4

Date	Apparent Right Ascension		Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
	^h ^m ^s	^s	[°] ['] [″]	[″]	[″]		^h ^m
May 17	2 03 05.40	+12.45	+11 59 10.8	1.65	0.42	1.317 5543	10 26.4
18	2 03 17.85	12.39	12 00 17.1	1.65	0.42	1.317 4195	10 22.7
19	2 03 30.24	12.32	12 01 23.0	1.65	0.42	1.317 2795	10 18.9
20	2 03 42.56	12.26	12 02 28.4	1.65	0.42	1.317 1344	10 15.2
21	2 03 54.82	12.18	12 03 33.4	1.65	0.42	1.316 9841	10 11.5
22	2 04 07.00	+12.12	+12 04 38.0	1.65	0.42	1.316 8288	10 07.8
23	2 04 19.12	12.04	12 05 42.2	1.65	0.42	1.316 6683	10 04.0
24	2 04 31.16	11.97	12 06 45.9	1.65	0.42	1.316 5027	10 00.3
25	2 04 43.13	11.89	12 07 49.2	1.65	0.42	1.316 3321	9 56.6
26	2 04 55.02	11.81	12 08 51.9	1.66	0.42	1.316 1564	9 52.8
27	2 05 06.83	+11.72	+12 09 54.2	1.66	0.43	1.315 9758	9 49.1
28	2 05 18.55	11.64	12 10 56.0	1.66	0.43	1.315 7902	9 45.4
29	2 05 30.19	11.56	12 11 57.2	1.66	0.43	1.315 5998	9 41.6
30	2 05 41.75	11.46	12 12 57.9	1.66	0.43	1.315 4045	9 37.9
31	2 05 53.21	11.37	12 13 58.0	1.66	0.43	1.315 2044	9 34.1
June 1	2 06 04.58	+11.27	+12 14 57.6	1.66	0.43	1.314 9996	9 30.4
2	2 06 15.85	11.18	12 15 56.7	1.66	0.43	1.314 7900	9 26.7
3	2 06 27.03	11.07	12 16 55.2	1.66	0.43	1.314 5758	9 22.9
4	2 06 38.10	10.97	12 17 53.1	1.66	0.43	1.314 3569	9 19.2
5	2 06 49.07	10.87	12 18 50.4	1.66	0.43	1.314 1334	9 15.4
6	2 06 59.94	+10.76	+12 19 47.1	1.66	0.43	1.313 9055	9 11.7
7	2 07 10.70	10.64	12 20 43.2	1.66	0.43	1.313 6731	9 07.9
8	2 07 21.34	10.53	12 21 38.6	1.67	0.43	1.313 4363	9 04.1
9	2 07 31.87	10.42	12 22 33.4	1.67	0.43	1.313 1952	9 00.4
10	2 07 42.29	10.31	12 23 27.5	1.67	0.43	1.312 9498	8 56.6
11	2 07 52.60	+10.19	+12 24 21.0	1.67	0.43	1.312 7002	8 52.8
12	2 08 02.79	10.07	12 25 13.8	1.67	0.43	1.312 4464	8 49.1
13	2 08 12.86	9.94	12 26 05.9	1.67	0.43	1.312 1886	8 45.3
14	2 08 22.80	9.82	12 26 57.3	1.67	0.43	1.311 9267	8 41.6
15	2 08 32.62	9.70	12 27 48.1	1.67	0.43	1.311 6608	8 37.8
16	2 08 42.32	+9.57	+12 28 38.2	1.67	0.43	1.311 3909	8 34.0
17	2 08 51.89	9.44	12 29 27.5	1.67	0.43	1.311 1172	8 30.2
18	2 09 01.33	9.31	12 30 16.2	1.68	0.43	1.310 8397	8 26.4
19	2 09 10.64	9.18	12 31 04.1	1.68	0.43	1.310 5584	8 22.7
20	2 09 19.82	9.04	12 31 51.2	1.68	0.43	1.310 2735	8 18.9
21	2 09 28.86	+8.91	+12 32 37.6	1.68	0.43	1.309 9849	8 15.1
22	2 09 37.77	8.77	12 33 23.3	1.68	0.43	1.309 6928	8 11.3
23	2 09 46.54	8.62	12 34 08.2	1.68	0.43	1.309 3971	8 07.5
24	2 09 55.16	8.49	12 34 52.3	1.68	0.43	1.309 0980	8 03.8
25	2 10 03.65	8.34	12 35 35.6	1.68	0.43	1.308 7954	8 00.0
26	2 10 11.99	+8.19	+12 36 18.2	1.68	0.43	1.308 4895	7 56.2
27	2 10 20.18	8.04	12 37 00.0	1.69	0.43	1.308 1803	7 52.4
28	2 10 28.22	7.90	12 37 40.9	1.69	0.43	1.307 8679	7 48.6
29	2 10 36.12	7.74	12 38 21.1	1.69	0.43	1.307 5524	7 44.8
30	2 10 43.86	7.58	12 39 00.4	1.69	0.43	1.307 2338	7 41.0
July 1	2 10 51.44	+7.43	+12 39 38.8	1.69	0.43	1.306 9123	7 37.2
2	2 10 58.87		+12 40 16.4	1.69	0.43	1.306 5880	7 33.3

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	^h ^m ^s	[°] ['] ^{''}	^{''}	^{''}		^h ^m
July 1	2 10 51.44 + 7.43	+12 39 38.8 +37.6	1.69	0.43	1.306 9123 -3243	7 37.2
2	2 10 58.87 7.27	12 40 16.4 36.8	1.69	0.43	306 5880 3272	7 33.3
3	2 11 06.14 7.11	12 40 53.2 35.9	1.69	0.43	306 2608 3298	7 29.5
4	2 11 13.25 6.95	12 41 29.1 35.0	1.69	0.44	305 9310 3325	7 25.7
5	2 11 20.20 6.79	12 42 04.1 34.1	1.70	0.44	305 5985 3350	7 21.9
6	2 11 26.99 + 6.63	+12 42 38.2 +33.3	1.70	0.44	1.305 2635 -3375	7 18.1
7	2 11 33.62 6.45	12 43 11.5 32.4	1.70	0.44	304 9260 3398	7 14.3
8	2 11 40.07 6.29	12 43 43.9 31.6	1.70	0.44	304 5862 3421	7 10.4
9	2 11 46.36 6.12	12 44 15.5 30.6	1.70	0.44	304 2441 3443	7 06.6
10	2 11 52.48 5.95	12 44 46.1 29.8	1.70	0.44	303 8998 3464	7 02.8
11	2 11 58.43 + 5.78	+12 45 15.9 +28.8	1.70	0.44	1.303 5534 -3484	6 59.0
12	2 12 04.21 5.61	12 45 44.7 28.0	1.71	0.44	303 2050 3504	6 55.1
13	2 12 09.82 5.44	12 46 12.7 27.0	1.71	0.44	302 8546 3523	6 51.3
14	2 12 15.26 5.27	12 46 39.7 26.1	1.71	0.44	302 5023 3540	6 47.4
15	2 12 20.53 5.09	12 47 05.8 25.2	1.71	0.44	302 1483 3557	6 43.6
16	2 12 25.62 + 4.91	+12 47 31.0 +24.2	1.71	0.44	1.301 7926 -3572	6 39.7
17	2 12 30.53 4.74	12 47 55.2 23.4	1.71	0.44	301 4354 3588	6 35.9
18	2 12 35.27 4.56	12 48 18.6 22.4	1.71	0.44	301 0766 3602	6 32.0
19	2 12 39.83 4.38	12 48 41.0 21.4	1.72	0.44	300 7164 3615	6 28.2
20	2 12 44.21 4.20	12 49 02.4 20.5	1.72	0.44	300 3549 3628	6 24.3
21	2 12 48.41 + 4.02	+12 49 22.9 +19.6	1.72	0.44	1.299 9921 -3640	6 20.5
22	2 12 52.43 3.84	12 49 42.5 18.6	1.72	0.44	299 6281 3651	6 16.6
23	2 12 56.27 3.65	12 50 01.1 17.6	1.72	0.44	299 2630 3661	6 12.7
24	2 12 59.92 3.47	12 50 18.7 16.7	1.72	0.44	298 8969 3670	6 08.8
25	2 13 03.39 3.28	12 50 35.4 15.7	1.72	0.44	298 5299 3678	6 05.0
26	2 13 06.67 + 3.10	+12 50 51.1 +14.8	1.73	0.44	1.298 1621 -3685	6 01.1
27	2 13 09.77 2.91	12 51 05.9 13.8	1.73	0.44	297 7936 3691	5 57.2
28	2 13 12.68 2.72	12 51 19.7 12.8	1.73	0.44	297 4245 3696	5 53.3
29	2 13 15.40 2.52	12 51 32.5 11.8	1.73	0.44	297 0549 3699	5 49.4
30	2 13 17.92 2.34	12 51 44.3 10.9	1.73	0.44	296 6850 3702	5 45.5
31	2 13 20.26 + 2.15	+12 51 55.2 + 9.8	1.73	0.44	1.296 3148 -3704	5 41.6
Aug. 1	2 13 22.41 1.96	12 52 05.0 8.9	1.73	0.45	295 9444 3704	5 37.8
2	2 13 24.37 1.76	12 52 13.9 7.9	1.74	0.45	295 5740 3704	5 33.9
3	2 13 26.13 1.58	12 52 21.8 6.9	1.74	0.45	295 2036 3702	5 29.9
4	2 13 27.71 1.39	12 52 28.7 5.9	1.74	0.45	294 8334 3700	5 26.0
5	2 13 29.10 + 1.19	+12 52 34.6 + 4.9	1.74	0.45	1.294 4634 -3695	5 22.1
6	2 13 30.29 1.01	12 52 39.5 4.0	1.74	0.45	294 0939 3691	5 18.2
7	2 13 31.30 0.81	12 52 43.5 3.0	1.74	0.45	293 7248 3684	5 14.3
8	2 13 32.11 0.62	12 52 46.5 2.0	1.74	0.45	293 3564 3678	5 10.4
9	2 13 32.73 0.43	12 52 48.5 + 1.0	1.75	0.45	292 9886 3670	5 06.5
10	2 13 33.16 + 0.24	+12 52 49.5 0.0	1.75	0.45	1.292 6216 -3660	5 02.5
11	2 13 33.40 + 0.05	12 52 49.5 - 1.0	1.75	0.45	292 2556 3651	4 58.6
12	2 13 33.45 - 0.15	12 52 48.5 2.0	1.75	0.45	291 8905 3639	4 54.7
13	2 13 33.30 0.33	12 52 46.5 2.9	1.75	0.45	291 5266 3627	4 50.7
14	2 13 32.97 0.52	12 52 43.6 3.8	1.75	0.45	291 1639 3613	4 46.8
15	2 13 32.45 - 0.72	+12 52 39.8 - 4.8	1.75	0.45	1.290 8026 -3600	4 42.9
16	2 13 31.73	+12 52 35.0	1.76	0.45	1.290 4426	4 38.9

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	^h ^m ^s	[°] ['] ^{''}				^h ^m
Aug. 16	2 13 31.73 — 0.90	+12 52 35.0 — 5.8	1.76	0.45	1.290 4426 — 3584	4 38.9
17	2 13 30.83 1.09	12 52 29.2 6.8	1.76	0.45	.290 0842 3568	4 35.0
18	2 13 29.74 1.28	12 52 22.4 7.7	1.76	0.45	.289 7274 3551	4 31.0
19	2 13 28.46 1.46	12 52 14.7 8.7	1.76	0.45	.289 3723 3533	4 27.1
20	2 13 27.00 1.65	12 52 06.0 9.7	1.76	0.45	.289 0190 3514	4 23.1
21	2 13 25.35 — 1.84	+12 51 56.3 — 10.6	1.76	0.45	1.288 6676 — 3493	4 19.1
22	2 13 23.51 2.03	12 51 45.7 11.6	1.76	0.45	.288 3183 3472	4 15.2
23	2 13 21.48 2.22	12 51 34.1 12.6	1.77	0.45	.287 9711 3449	4 11.2
24	2 13 19.26 2.40	12 51 21.5 13.5	1.77	0.45	.287 6262 3426	4 07.2
25	2 13 16.86 2.59	12 51 08.0 14.4	1.77	0.45	.287 2836 3400	4 03.3
26	2 13 14.27 — 2.77	+12 50 53.6 — 15.4	1.77	0.45	1.286 9436 — 3374	3 59.3
27	2 13 11.50 2.95	12 50 38.2 16.3	1.77	0.45	.286 6062 3346	3 55.3
28	2 13 08.55 3.14	12 50 21.9 17.2	1.77	0.46	.286 2716 3318	3 51.3
29	2 13 05.41 3.31	12 50 04.7 18.2	1.77	0.46	.285 9398 3288	3 47.4
30	2 13 02.10 3.49	12 49 46.5 19.1	1.78	0.46	.285 6110 3257	3 43.4
31	2 12 58.61 — 3.67	+12 49 27.4 — 20.0	1.78	0.46	1.285 2853 — 3226	3 39.4
Sept. 1	2 12 54.94 3.85	12 49 07.4 20.8	1.78	0.46	.284 9627 3192	3 35.4
2	2 12 51.09 4.02	12 48 46.6 21.8	1.78	0.46	.284 6435 3158	3 31.4
3	2 12 47.07 4.20	12 48 24.8 22.6	1.78	0.46	.284 3277 3122	3 27.4
4	2 12 42.87 4.36	12 48 02.2 23.5	1.78	0.46	.284 0155 3087	3 23.4
5	2 12 38.51 — 4.53	+12 47 38.7 — 24.4	1.78	0.46	1.283 7068 — 3049	3 19.4
6	2 12 33.98 4.70	12 47 14.3 25.2	1.78	0.46	.283 4019 3010	3 15.4
7	2 12 29.28 4.87	12 46 49.1 26.1	1.79	0.46	.283 1009 2971	3 11.4
8	2 12 24.41 5.03	12 46 23.0 26.9	1.79	0.46	.282 8038 2931	3 07.4
9	2 12 19.38 5.19	12 45 56.1 27.7	1.79	0.46	.282 5107 2889	3 03.4
10	2 12 14.19 — 5.34	+12 45 28.4 — 28.5	1.79	0.46	1.282 2218 — 2847	2 59.3
11	2 12 08.85 5.50	12 44 59.9 29.4	1.79	0.46	.281 9371 2805	2 55.3
12	2 12 03.35 5.66	12 44 30.5 30.1	1.79	0.46	.281 6566 2760	2 51.3
13	2 12 57.69 5.81	12 44 00.4 30.9	1.79	0.46	.281 3806 2715	2 47.3
14	2 12 51.88 5.96	12 43 29.5 31.6	1.79	0.46	.281 1091 2670	2 43.2
15	2 12 45.92 — 6.11	+12 42 57.9 — 32.5	1.80	0.46	1.280 8421 — 2623	2 39.2
16	2 12 39.81 6.25	12 42 25.4 33.2	1.80	0.46	.280 5798 2576	2 35.2
17	2 12 33.56 6.40	12 41 52.2 33.9	1.80	0.46	.280 3222 2526	2 31.1
18	2 12 27.16 6.54	12 41 18.3 34.6	1.80	0.46	.280 0696 2477	2 27.1
19	2 12 20.62 6.68	12 40 43.7 35.4	1.80	0.46	.279 8219 2426	2 23.1
20	2 12 13.94 — 6.82	+12 40 08.3 — 36.0	1.80	0.46	1.279 5793 — 2374	2 19.0
21	2 12 07.12 6.95	12 39 32.3 36.8	1.80	0.46	.279 3419 2321	2 14.9
22	2 12 00.17 7.08	12 38 55.5 37.4	1.80	0.46	.279 1098 2268	2 10.9
23	2 12 53.09 7.21	12 38 18.1 38.1	1.80	0.46	.278 8830 2214	2 06.9
24	2 12 45.88 7.34	12 37 40.0 38.7	1.80	0.46	.278 6616 2159	2 02.8
25	2 12 38.54 — 7.46	+12 37 01.3 — 39.4	1.81	0.46	1.278 4457 — 2103	1 58.8
26	2 12 31.08 7.58	12 36 21.9 40.0	1.81	0.46	.278 2354 2046	1 54.7
27	2 12 23.50 7.69	12 35 41.9 40.5	1.81	0.46	.278 0308 1987	1 50.6
28	2 12 15.81 7.81	12 35 01.4 41.2	1.81	0.46	.277 8321 1929	1 46.6
29	2 12 08.00 7.92	12 34 20.2 41.7	1.81	0.46	.277 6392 1870	1 42.5
30	2 12 00.08 — 8.02	+12 33 38.5 — 42.3	1.81	0.46	1.277 4522 — 1809	1 38.5
Oct. 1	2 09 52.06 8.02	+12 32 56.2 — 42.3	1.81	0.46	1.277 2713 — 1809	1 34.4

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Oct. 1	^h 2 ^m 09 ^s 52.06 — 8.13	+12 32 56.2 — 42.8	1.81	0.46	1.277 2713 — 1748	^h 1 ^m 34.4
2	2 09 43.93 8.23	12 32 13.4 — 43.3	1.81	0.46	.277 0965 1686	1 30.3
3	2 09 35.70 8.32	12 31 30.1 43.7	1.81	0.47	.276 9279 1624	1 26.3
4	2 09 27.38 8.42	12 30 46.4 44.3	1.81	0.47	.276 7655 1560	1 22.2
5	2 09 18.96 8.50	12 30 02.1 44.7	1.81	0.47	.276 6095 1497	1 18.1
6	2 09 10.46 8.58	+12 29 17.4 — 45.1	1.81	0.47	1.276 4598 — 1433	1 14.1
7	2 09 01.88 8.67	12 28 32.3 45.6	1.81	0.47	.276 3165 1368	1 10.0
8	2 08 53.21 8.74	12 27 46.7 45.9	1.81	0.47	.276 1797 1303	1 05.9
9	2 08 44.47 8.82	12 27 00.8 46.3	1.81	0.47	.276 0494 1238	1 01.8
10	2 08 35.65 8.89	12 26 14.5 46.7	1.81	0.47	.275 9256 1172	0 57.8
11	2 08 26.76 8.96	+12 25 27.8 — 47.1	1.81	0.47	1.275 8084 — 1106	0 53.7
12	2 08 17.80 9.02	12 24 40.7 47.3	1.81	0.47	.275 6978 1039	0 49.6
13	2 08 08.78 9.07	12 23 53.4 47.7	1.81	0.47	.275 5939 973	0 45.5
14	2 07 59.71 9.13	12 23 05.7 48.0	1.81	0.47	.275 4966 904	0 41.4
15	2 07 50.58 9.19	12 22 17.7 48.2	1.81	0.47	.275 4062 836	0 37.3
16	2 07 41.39 9.23	+12 21 29.5 — 48.5	1.81	0.47	1.275 3226 — 768	0 33.3
17	2 07 32.16 9.28	12 20 41.0 48.7	1.81	0.47	.275 2458 698	0 29.2
18	2 07 22.88 9.32	12 19 52.3 48.9	1.81	0.47	.275 1760 629	0 25.1
19	2 07 13.56 9.36	12 19 03.4 49.1	1.82	0.47	.275 1131 559	0 21.0
20	2 07 04.20 9.39	12 18 14.3 49.3	1.82	0.47	.275 0572 489	0 16.9
21	2 06 54.81 9.42	+12 17 25.0 — 49.4	1.82	0.47	1.275 0083 — 419	0 12.8
22	2 06 45.39 9.44	12 16 35.6 49.6	1.82	0.47	.274 9664 348	0 08.7
23	2 06 35.95 9.47	12 15 46.0 49.6	1.82	0.47	.274 9316 278	0 04.7
24	2 06 26.48 9.48	12 14 56.4 49.8	1.82	0.47	.274 9038 206	{ 0 00.6 }
25	2 06 17.00 9.50	12 14 06.6 49.8	1.82	0.47	.274 8832 135	{ 23 56.5 }
26	2 06 07.50 9.50	+12 13 16.8 — 49.8	1.82	0.47	1.274 8697 — 64	23 48.3
27	2 05 58.00 9.51	12 12 27.0 49.8	1.82	0.47	.274 8633 + 8	23 44.2
28	2 05 48.49 9.50	12 11 37.2 49.8	1.82	0.47	.274 8641 79	23 40.1
29	2 05 38.99 9.50	12 10 47.4 49.8	1.82	0.47	.274 8720 151	23 36.0
30	2 05 29.49 9.49	12 09 57.6 49.7	1.82	0.47	.274 8871 222	23 31.9
31	2 05 20.00 9.48	+12 09 07.9 — 49.6	1.82	0.47	1.274 9093 + 293	23 27.8
Nov. 1	2 05 10.52 9.46	12 08 18.3 49.6	1.82	0.47	.274 9386 365	23 23.8
2	2 05 01.06 9.43	12 07 28.7 49.4	1.82	0.47	.274 9751 436	23 19.7
3	2 04 51.63 9.41	12 06 39.3 49.3	1.82	0.47	.275 0187 507	23 15.6
4	2 04 42.22 9.37	12 05 50.0 49.1	1.82	0.47	.275 0694 578	23 11.5
5	2 04 32.85 9.35	+12 05 00.9 — 48.9	1.82	0.47	1.275 1272 + 648	23 07.4
6	2 04 23.50 9.30	12 04 12.0 48.7	1.81	0.47	.275 1920 718	23 03.3
7	2 04 14.20 9.26	12 03 23.3 48.5	1.81	0.47	.275 2638 788	22 59.2
8	2 04 04.94 9.22	12 02 34.8 48.2	1.81	0.47	.275 3426 857	22 55.2
9	2 03 55.72 9.17	12 01 46.6 47.9	1.81	0.47	.275 4283 927	22 51.1
10	2 03 46.55 9.11	+12 00 58.7 — 47.7	1.81	0.47	1.275 5210 + 995	22 47.0
11	2 03 37.44 9.05	12 00 11.0 47.3	1.81	0.47	.275 6205 1064	22 42.9
12	2 03 28.39 8.99	11 59 23.7 46.9	1.81	0.47	.275 7269 1132	22 38.8
13	2 03 19.40 8.92	11 58 36.8 46.7	1.81	0.47	.275 8401 1200	22 34.7
14	2 03 10.48 8.86	11 57 50.1 46.3	1.81	0.47	.275 9601 1268	22 30.7
15	2 03 01.62 8.79	+11 57 03.8 — 45.9	1.81	0.47	1.276 0869 + 1335	22 26.6
16	2 02 52.83 8.79	+11 56 17.9 — 45.9	1.81	0.47	1.276 2204 + 1335	22 22.5

URANUS, 1935

231

Date	Apparent Right Ascension		Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
	^h ^m	^s	[°] ['] ["]	["]	["]		^h ^m
Nov. 16	2 02	52.83	+11 56 17.9	1.81	0.47	1.276 2204	22 22.5
17	2 02	44.12	II 55 32.5	1.81	0.47	1.276 3605	22 18.4
18	2 02	35.49	II 54 47.5	1.81	0.47	1.276 5072	22 14.4
19	2 02	26.95	II 54 02.9	1.81	0.47	1.276 6605	22 10.3
20	2 02	18.49	II 53 18.9	1.81	0.47	1.276 8203	22 06.2
21	2 02	10.13	+11 52 35.3	1.81	0.47	1.276 9865	22 02.1
22	2 02	01.86	II 51 52.2	1.81	0.46	1.277 1592	21 58.1
23	2 01	53.69	II 51 09.7	1.81	0.46	1.277 3383	21 54.0
24	2 01	45.63	II 50 27.8	1.81	0.46	1.277 5236	21 50.0
25	2 01	37.67	II 49 46.5	1.81	0.46	1.277 7152	21 45.9
26	2 01	29.82	+11 49 05.7	1.81	0.46	1.277 9129	21 41.8
27	2 01	22.09	II 48 25.6	1.81	0.46	1.278 1167	21 37.8
28	2 01	14.47	II 47 46.1	1.81	0.46	1.278 3265	21 33.7
29	2 01	06.97	II 47 07.3	1.81	0.46	1.278 5422	21 29.7
30	2 00	59.60	II 46 29.1	1.80	0.46	1.278 7637	21 25.6
Dec. 1	2 00	52.36	+11 45 51.7	1.80	0.46	1.278 9909	21 21.6
2	2 00	45.26	II 45 15.0	1.80	0.46	1.279 2238	21 17.5
3	2 00	38.29	II 44 39.0	1.80	0.46	1.279 4622	21 13.5
4	2 00	31.45	II 44 03.8	1.80	0.46	1.279 7060	21 09.4
5	2 00	24.75	II 43 29.3	1.80	0.46	1.279 9552	21 05.4
6	2 00	18.20	+11 42 55.6	1.80	0.46	1.280 2096	21 01.3
7	2 00	11.79	II 42 22.7	1.80	0.46	1.280 4691	20 57.3
8	2 00	05.53	II 41 50.7	1.80	0.46	1.280 7337	20 53.3
9	1 59	59.42	II 41 19.4	1.79	0.46	1.281 0033	20 49.2
10	1 59	53.46	II 40 49.0	1.79	0.46	1.281 2777	20 45.2
11	1 59	47.66	+11 40 19.4	1.79	0.46	1.281 5569	20 41.2
12	1 59	42.02	II 39 50.6	1.79	0.46	1.281 8407	20 37.2
13	1 59	36.53	II 39 22.8	1.79	0.46	1.282 1292	20 33.2
14	1 59	31.21	II 38 55.8	1.79	0.46	1.282 4221	20 29.1
15	1 59	26.06	II 38 29.7	1.79	0.46	1.282 7194	20 25.1
16	1 59	21.07	+11 38 04.5	1.79	0.46	1.283 0210	20 21.1
17	1 59	16.25	II 37 40.3	1.79	0.46	1.283 3268	20 17.1
18	1 59	11.60	II 37 17.0	1.78	0.46	1.283 6366	20 13.1
19	1 59	07.12	II 36 54.7	1.78	0.46	1.283 9504	20 09.1
20	1 59	02.82	II 36 33.3	1.78	0.46	1.284 2680	20 05.1
21	1 58	58.70	+11 36 12.9	1.78	0.46	1.284 5893	20 01.1
22	1 58	54.76	II 35 53.5	1.78	0.46	1.284 9143	19 57.1
23	1 58	51.00	II 35 35.1	1.78	0.46	1.285 2428	19 53.1
24	1 58	47.43	II 35 17.7	1.78	0.46	1.285 5747	19 49.1
25	1 58	44.04	II 35 01.3	1.77	0.46	1.285 9099	19 45.1
26	1 58	40.83	+11 34 45.9	1.77	0.46	1.286 2482	19 41.1
27	1 58	37.82	II 34 31.6	1.77	0.45	1.286 5896	19 37.2
28	1 58	34.99	II 34 18.3	1.77	0.45	1.286 9338	19 33.2
29	1 58	32.36	II 34 06.1	1.77	0.45	1.287 2808	19 29.2
30	1 58	29.92	II 33 54.9	1.77	0.45	1.287 6304	19 25.2
31	1 58	27.67	+11 33 44.8	1.77	0.45	1.287 9825	19 21.3
32	1 58	25.62	+11 33 35.7	1.76	0.45	1.288 3370	19 17.3

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Jan. 1	^h ^m ^s II 04 28.41 ^s -1.81	[°] ['] [″] +6 58 09.6 ^s +14.0	[″] 1.23	0.30	I.473 6430 ^s -2286	^h ^m 4 24.9
2	II 04 26.60 ^s 1.94	6 58 23.6 ^s 14.6	1.23	0.30	.473 4144 ^s 2267	4 20.9
3	II 04 24.66 ^s 2.06	6 58 38.2 ^s 15.4	1.23	0.30	.473 1877 ^s 2249	4 17.0
4	II 04 22.60 ^s 2.18	6 58 53.6 ^s 16.1	1.23	0.30	.472 9628 ^s 2228	4 13.0
5	II 04 20.42 ^s 2.29	6 59 09.7 ^s 16.8	1.23	0.30	.472 7400 ^s 2207	4 09.0
6	II 04 18.13 ^s -2.42	+6 59 26.5 ^s +17.6	1.23	0.30	I.472 5193 ^s -2185	4 05.0
7	II 04 15.71 ^s 2.53	6 59 44.1 ^s 18.3	1.23	0.30	.472 3008 ^s 2163	4 01.1
8	II 04 13.18 ^s 2.64	7 00 02.4 ^s 19.0	1.23	0.30	.472 0845 ^s 2139	3 57.1
9	II 04 10.54 ^s 2.76	7 00 21.4 ^s 19.6	1.23	0.30	.471 8706 ^s 2116	3 53.1
10	II 04 07.78 ^s 2.88	7 00 41.0 ^s 20.3	1.23	0.30	.471 6590 ^s 2091	3 49.1
11	II 04 04.90 ^s -2.98	+7 01 01.3 ^s +21.0	1.23	0.30	I.471 4499 ^s -2065	3 45.2
12	II 04 01.92 ^s 3.09	7 01 22.3 ^s 21.6	1.24	0.30	.471 2434 ^s 2039	3 41.2
13	II 03 58.83 ^s 3.20	7 01 43.9 ^s 22.3	1.24	0.30	.471 0395 ^s 2013	3 37.2
14	II 03 55.63 ^s 3.31	7 02 06.2 ^s 23.0	1.24	0.30	.470 8382 ^s 1985	3 33.2
15	II 03 52.32 ^s 3.41	7 02 29.2 ^s 23.6	1.24	0.30	.470 6397 ^s 1957	3 29.2
16	II 03 48.91 ^s -3.52	+7 02 52.8 ^s +24.2	1.24	0.30	I.470 4440 ^s -1928	3 25.2
17	II 03 45.39 ^s 3.62	7 03 17.0 ^s 24.8	1.24	0.30	.470 2512 ^s 1899	3 21.2
18	II 03 41.77 ^s 3.72	7 03 41.8 ^s 25.4	1.24	0.30	.470 0613 ^s 1869	3 17.2
19	II 03 38.05 ^s 3.82	7 04 07.2 ^s 26.0	1.24	0.30	.469 8744 ^s 1838	3 13.2
20	II 03 34.23 ^s 3.92	7 04 33.2 ^s 26.6	1.24	0.30	.469 6906 ^s 1807	3 09.3
21	II 03 30.31 ^s -4.02	+7 04 59.8 ^s +27.2	1.24	0.30	I.469 5099 ^s -1776	3 05.3
22	II 03 26.29 ^s 4.11	7 05 27.0 ^s 27.7	1.24	0.30	.469 3323 ^s 1743	3 01.3
23	II 03 22.18 ^s 4.20	7 05 54.7 ^s 28.3	1.24	0.30	.469 1580 ^s 1711	2 57.3
24	II 03 17.98 ^s 4.30	7 06 23.0 ^s 28.8	1.24	0.30	.468 9869 ^s 1677	2 53.3
25	II 03 13.68 ^s 4.38	7 06 51.8 ^s 29.3	1.24	0.30	.468 8192 ^s 1643	2 49.3
26	II 03 09.30 ^s -4.47	+7 07 21.1 ^s +29.9	1.24	0.30	I.468 6549 ^s -1609	2 45.3
27	II 03 04.83 ^s 4.56	7 07 51.0 ^s 30.4	1.24	0.30	.468 4940 ^s 1573	2 41.3
28	II 03 00.27 ^s 4.65	7 08 21.4 ^s 30.9	1.24	0.30	.468 3367 ^s 1537	2 37.2
29	II 02 55.62 ^s 4.72	7 08 52.3 ^s 31.3	1.24	0.30	.468 1830 ^s 1501	2 33.2
30	II 02 50.90 ^s 4.81	7 09 23.6 ^s 31.9	1.24	0.30	.468 0329 ^s 1463	2 29.2
31	II 02 46.09 ^s -4.89	+7 09 55.5 ^s +32.3	1.24	0.30	I.467 8866 ^s -1426	2 25.2
Feb. 1	II 02 41.20 ^s 4.97	7 10 27.8 ^s 32.7	1.25	0.30	.467 7440 ^s 1388	2 21.2
2	II 02 36.23 ^s 5.04	7 11 00.5 ^s 33.1	1.25	0.30	.467 6052 ^s 1349	2 17.2
3	II 02 31.19 ^s 5.12	7 11 33.6 ^s 33.6	1.25	0.30	.467 4703 ^s 1311	2 13.2
4	II 02 26.07 ^s 5.18	7 12 07.2 ^s 34.0	1.25	0.30	.467 3392 ^s 1271	2 09.2
5	II 02 20.89 ^s -5.26	+7 12 41.2 ^s +34.4	1.25	0.30	I.467 2121 ^s -1231	2 05.1
6	II 02 15.63 ^s 5.32	7 13 15.6 ^s 34.7	1.25	0.30	.467 0890 ^s 1190	2 01.1
7	II 02 10.31 ^s 5.38	7 13 50.3 ^s 35.2	1.25	0.30	.466 9700 ^s 1149	1 57.1
8	II 02 04.93 ^s 5.44	7 14 25.5 ^s 35.4	1.25	0.30	.466 8551 ^s 1107	1 53.1
9	II 01 59.49 ^s 5.51	7 15 00.9 ^s 35.8	1.25	0.30	.466 7444 ^s 1066	1 49.0
10	II 01 53.98 ^s -5.56	+7 15 36.7 ^s +36.1	1.25	0.30	I.466 6378 ^s -1024	1 45.0
11	II 01 48.42 ^s 5.61	7 16 12.8 ^s 36.3	1.25	0.30	.466 5354 ^s 981	1 41.0
12	II 01 42.81 ^s 5.67	7 16 49.1 ^s 36.7	1.25	0.30	.466 4373 ^s 939	1 37.0
13	II 01 37.14 ^s 5.71	7 17 25.8 ^s 36.9	1.25	0.30	.466 3434 ^s 896	1 33.0
14	II 01 31.43 ^s 5.77	7 18 02.7 ^s 37.1	1.25	0.30	.466 2538 ^s 853	1 28.9
15	II 01 25.66 ^s -5.81	+7 18 39.8 ^s +37.4	1.25	0.30	I.466 1685 ^s -810	1 24.9
16	II 01 19.85 ^s	+7 19 17.2 ^s	1.25	0.30	I.466 0875 ^s	1 20.9

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Feb. 16	^h ^m ^s 11 01 19.85 ^{-5.85}	[°] ['] ["] +7 19 17.2 ^{+37.6}	1.25	0.30	1.466 0875 ⁻⁷⁶⁶	^h ^m 1 20.9
17	11 01 14.00 ^{-5.89}	7 19 54.8 ^{+37.8}	1.25	0.30	.466 0109 ⁻⁷²²	1 16.8
18	11 01 08.11 ^{-5.93}	7 20 32.6 ^{-38.0}	1.25	0.30	.465 9387 ⁻⁶⁷⁹	1 12.8
19	11 01 02.18 ^{-5.96}	7 21 10.6 ^{-38.2}	1.25	0.30	.465 8708 ⁻⁶³⁵	1 08.8
20	11 00 56.22 ^{-6.00}	7 21 48.8 ^{-38.4}	1.25	0.30	.465 8073 ⁻⁵⁹⁰	1 04.7
21	11 00 50.22 ^{-6.03}	+7 22 27.2 ^{+38.5}	1.25	0.30	1.465 7483 ⁻⁵⁴⁶	1 00.7
22	11 00 44.19 ^{-6.06}	7 23 05.7 ^{-38.6}	1.25	0.30	.465 6937 ⁻⁵⁰¹	0 56.7
23	11 00 38.13 ^{-6.09}	7 23 44.3 ^{-38.8}	1.25	0.30	.465 6436 ⁻⁴⁵⁵	0 52.6
24	11 00 32.04 ^{-6.11}	7 24 23.1 ^{-38.9}	1.25	0.30	.465 5981 ⁻⁴⁰⁹	0 48.6
25	11 00 25.93 ^{-6.14}	7 25 02.0 ^{-39.0}	1.25	0.30	.465 5572 ⁻³⁶⁵	0 44.6
26	11 00 19.79 ^{-6.15}	+7 25 41.0 ^{+39.0}	1.25	0.30	1.465 5207 ⁻³¹⁹	0 40.6
27	11 00 13.64 ^{-6.17}	7 26 20.0 ^{-39.1}	1.25	0.30	.465 4888 ⁻²⁷⁴	0 36.5
28	11 00 07.47 ^{-6.18}	7 26 59.1 ^{-39.2}	1.25	0.30	.465 4614 ⁻²²⁸	0 32.5
Mar. 1	11 00 01.29 ^{-6.19}	7 27 38.3 ^{-39.1}	1.25	0.30	.465 4386 ⁻¹⁸³	0 28.5
2	10 59 55.10 ^{-6.20}	7 28 17.4 ^{-39.2}	1.25	0.30	.465 4203 ⁻¹³⁷	0 24.4
3	10 59 48.90 ^{-6.21}	+7 28 56.6 ^{+39.1}	1.25	0.30	1.465 4066 ⁻⁹¹	0 20.4
4	10 59 42.69 ^{-6.21}	7 29 35.7 ^{-39.2}	1.25	0.30	.465 3975 ⁻⁴⁵	0 16.4
5	10 59 36.48 ^{-6.21}	7 30 14.9 ^{-39.1}	1.25	0.30	.465 3930 ⁻⁰	0 12.3
6	10 59 30.27 ^{-6.22}	7 30 54.0 ^{-39.0}	1.25	0.30	.465 3930 ⁺⁴⁷	0 08.3
7	10 59 24.05 ^{-6.21}	7 31 33.0 ^{-39.0}	1.25	0.30	.465 3977 ⁺⁹²	0 04.2
8	10 59 17.84 ^{-6.20}	+7 32 12.0 ^{+38.9}	1.25	0.30	1.465 4069 ⁺¹³⁹	{ 0 00.2 } 23 56.2
9	10 59 11.64 ^{-6.20}	7 32 50.9 ^{-38.8}	1.25	0.30	.465 4208 ⁺¹⁸⁴	23 52.1
10	10 59 05.44 ^{-6.18}	7 33 29.7 ^{-38.6}	1.25	0.30	.465 4392 ⁺²³⁰	23 48.1
11	10 58 59.26 ^{-6.16}	7 34 08.3 ^{-38.5}	1.25	0.30	.465 4622 ⁺²⁷⁵	23 44.1
12	10 58 53.10 ^{-6.15}	7 34 46.8 ^{-38.4}	1.25	0.30	.465 4897 ⁺³²¹	23 40.1
13	10 58 46.95 ^{-6.13}	+7 35 25.2 ^{+38.2}	1.25	0.30	1.465 5218 ⁺³⁶⁶	23 36.0
14	10 58 40.82 ^{-6.11}	7 36 03.4 ^{-38.0}	1.25	0.30	.465 5584 ⁺⁴⁰⁹	23 32.0
15	10 58 34.71 ^{-6.08}	7 36 41.4 ^{-37.8}	1.25	0.30	.465 5993 ⁺⁴⁵⁴	23 28.0
16	10 58 28.63 ^{-6.06}	7 37 19.2 ^{-37.6}	1.25	0.30	.465 6447 ⁺⁴⁹⁸	23 23.9
17	10 58 22.57 ^{-6.03}	7 37 56.8 ^{-37.4}	1.25	0.30	.465 6945 ⁺⁵⁴²	23 19.9
18	10 58 16.54 ^{-5.99}	+7 38 34.2 ^{+37.2}	1.25	0.30	1.465 7487 ⁺⁵⁸⁶	23 15.8
19	10 58 10.55 ^{-5.97}	7 39 11.4 ^{-36.9}	1.25	0.30	.465 8073 ⁺⁶²⁹	23 11.8
20	10 58 04.58 ^{-5.93}	7 39 48.3 ^{-36.6}	1.25	0.30	.465 8702 ⁺⁶⁷²	23 07.8
21	10 57 58.65 ^{-5.89}	7 40 24.9 ^{-36.4}	1.25	0.30	.465 9374 ⁺⁷¹⁶	23 03.8
22	10 57 52.76 ^{-5.85}	7 41 01.3 ^{-36.1}	1.25	0.30	.466 0090 ⁺⁷⁵⁹	22 59.7
23	10 57 46.91 ^{-5.81}	+7 41 37.4 ^{+35.8}	1.25	0.30	1.466 0849 ⁺⁸⁰¹	22 55.7
24	10 57 41.10 ^{-5.77}	7 42 13.2 ^{-35.5}	1.25	0.30	.466 1650 ⁺⁸⁴³	22 51.7
25	10 57 35.33 ^{-5.72}	7 42 48.7 ^{-35.1}	1.25	0.30	.466 2493 ⁺⁸⁸⁵	22 47.6
26	10 57 29.61 ^{-5.67}	7 43 23.8 ^{-34.8}	1.25	0.30	.466 3378 ⁺⁹²⁷	22 43.6
27	10 57 23.94 ^{-5.62}	7 43 58.6 ^{-34.4}	1.25	0.30	.466 4305 ⁺⁹⁶⁸	22 39.6
28	10 57 18.32 ^{-5.57}	+7 44 33.0 ^{+34.0}	1.25	0.30	1.466 5273 ⁺¹⁰⁰⁹	22 35.6
29	10 57 12.75 ^{-5.51}	7 45 07.0 ^{-33.7}	1.25	0.30	.466 6282 ⁺¹⁰⁴⁹	22 31.5
30	10 57 07.24 ^{-5.45}	7 45 40.7 ^{-33.3}	1.25	0.30	.466 7331 ⁺¹⁰⁹⁰	22 27.5
31	10 57 01.79 ^{-5.39}	7 46 14.0 ^{-32.9}	1.25	0.30	.466 8421 ⁺¹¹³⁰	22 23.5
Apr. 1	10 56 56.40 ^{-5.33}	7 46 46.9 ^{-32.4}	1.25	0.30	.466 9551 ⁺¹¹⁶⁹	22 19.5
2	10 56 51.07 ^{-5.27}	+7 47 19.3 ^{+32.1}	1.25	0.30	1.467 0720 ⁺¹²⁰⁸	22 15.5
3	10 56 45.80 ^{-5.27}	+7 47 51.4 ^{+32.1}	1.25	0.30	1.467 1928 ⁺¹²⁰⁸	22 11.5

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Apr. 1	^h 10 ^m 56 ^s 56.40 ^s -5.33	+7 46 46.9 ^s +32.4	1.25	0.30	I.466 9551 +1169	^h 22 ^m 19.5
2	10 56 51.07 5.27	7 47 19.3 32.1	1.25	0.30	.467 0720 1208	22 15.5
3	10 56 45.80 5.20	7 47 51.4 31.6	1.25	0.30	.467 1928 1247	22 11.5
4	10 56 40.60 5.14	7 48 23.0 31.1	1.25	0.30	.467 3175 1285	22 07.4
5	10 56 35.46 5.06	7 48 54.1 30.6	1.25	0.30	.467 4460 1323	22 03.4
6	10 56 30.40 -4.99	+7 49 24.7 +30.2	1.25	0.30	I.467 5783 +1359	21 59.4
7	10 56 25.41 4.92	7 49 54.9 29.7	1.25	0.30	.467 7142 1396	21 55.4
8	10 56 20.49 4.84	7 50 24.6 29.1	1.24	0.30	.467 8538 1432	21 51.4
9	10 56 15.65 4.76	7 50 53.7 28.6	1.24	0.30	.467 9970 1467	21 47.4
10	10 56 10.89 4.68	7 51 22.3 28.1	1.24	0.30	.468 1437 1502	21 43.3
11	10 56 06.21 -4.60	+7 51 50.4 +27.6	1.24	0.30	I.468 2939 +1536	21 39.3
12	10 56 01.61 4.52	7 52 18.0 27.0	1.24	0.30	.468 4475 1569	21 35.3
13	10 55 57.09 4.43	7 52 45.0 26.5	1.24	0.30	.468 6044 1603	21 31.3
14	10 55 52.66 4.35	7 53 11.5 25.9	1.24	0.30	.468 7647 1635	21 27.3
15	10 55 48.31 4.26	7 53 37.4 25.4	1.24	0.30	.468 9282 1667	21 23.3
16	10 55 44.05 -4.17	+7 54 02.8 +24.8	1.24	0.30	I.469 0949 +1698	21 19.3
17	10 55 39.88 4.08	7 54 27.6 24.2	1.24	0.30	.469 2647 1729	21 15.3
18	10 55 35.80 3.98	7 54 51.8 23.5	1.24	0.30	.469 4376 1759	21 11.3
19	10 55 31.82 3.89	7 55 15.3 23.0	1.24	0.30	.469 6135 1789	21 07.3
20	10 55 27.93 3.80	7 55 38.3 22.4	1.24	0.30	.469 7924 1817	21 03.3
21	10 55 24.13 -3.70	+7 56 00.7 +21.7	1.24	0.30	I.469 9741 +1846	20 59.3
22	10 55 20.43 3.60	7 56 22.4 21.2	1.24	0.30	.470 1587 1873	20 55.3
23	10 55 16.83 3.50	7 56 43.6 20.5	1.24	0.30	.470 3460 1901	20 51.4
24	10 55 13.33 3.40	7 57 04.1 19.8	1.24	0.30	.470 5361 1928	20 47.4
25	10 55 09.93 3.31	7 57 23.9 19.2	1.24	0.30	.470 7289 1953	20 43.4
26	10 55 06.62 -3.20	+7 57 43.1 +18.6	1.24	0.30	I.470 9242 +1979	20 39.4
27	10 55 03.42 3.10	7 58 01.7 17.9	1.24	0.30	.471 1221 2004	20 35.4
28	10 55 00.32 2.99	7 58 19.6 17.2	1.24	0.30	.471 3225 2028	20 31.5
29	10 54 57.33 2.88	7 58 36.8 16.5	1.23	0.30	.471 5253 2051	20 27.5
30	10 54 54.45 2.78	7 58 53.3 15.9	1.23	0.30	.471 7304 2074	20 23.5
May 1	10 54 51.67 -2.67	+7 59 09.2 +15.2	1.23	0.30	I.471 9378 +2096	20 19.5
2	10 54 49.00 2.56	7 59 24.4 14.4	1.23	0.30	.472 1474 2118	20 15.5
3	10 54 46.44 2.44	7 59 38.8 13.8	1.23	0.30	.472 3592 2139	20 11.6
4	10 54 44.00 2.34	7 59 52.6 13.0	1.23	0.30	.472 5731 2158	20 07.6
5	10 54 41.66 2.22	8 00 05.6 12.4	1.23	0.30	.472 7889 2178	20 03.6
6	10 54 39.44 -2.10	+8 00 18.0 +11.6	1.23	0.30	I.473 0067 +2197	19 59.7
7	10 54 37.34 2.00	8 00 29.6 10.9	1.23	0.30	.473 2264 2214	19 55.7
8	10 54 35.34 1.88	8 00 40.5 10.2	1.23	0.30	.473 4478 2231	19 51.7
9	10 54 33.46 1.76	8 00 50.7 9.4	1.23	0.30	.473 6709 2247	19 47.8
10	10 54 31.70 1.64	8 01 00.1 8.8	1.23	0.30	.473 8956 2262	19 43.8
11	10 54 30.06 -1.53	+8 01 08.9 +8.0	1.23	0.30	I.474 1218 +2278	19 39.9
12	10 54 28.53 1.41	8 01 16.9 7.2	1.23	0.30	.474 3496 2291	19 35.9
13	10 54 27.12 1.29	8 01 24.1 6.6	1.23	0.30	.474 5787 2305	19 31.9
14	10 54 25.83 1.18	8 01 30.7 5.8	1.23	0.29	.474 8092 2317	19 28.0
15	10 54 24.65 1.06	8 01 36.5 5.1	1.22	0.29	.475 0409 2330	19 24.0
16	10 54 23.59 -0.94	+8 01 41.6 +4.3	1.22	0.29	I.475 2739 +2340	19 20.1
17	10 54 22.65	+8 01 45.9	1.22	0.29	I.475 5079	19 16.1

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
May	^h ^m ^s 17 10 54 22.65 ^s -0.81	[°] ['] ["] +8 01 45.9 ^s +3.6	["] 1.22	["] 0.29	1.475 5079 ^s +2351	^h ^m 19 16.1
	18 10 54 21.84 ^s 0.70	8 01 49.5 ^s 2.8	1.22	0.29	.475 7430 ^s 2360	19 12.2
	19 10 54 21.14 ^s 0.58	8 01 52.3 ^s 2.1	1.22	0.29	.475 9790 ^s 2370	19 08.3
	20 10 54 20.56 ^s 0.46	8 01 54.4 ^s 1.4	1.22	0.29	.476 2160 ^s 2379	19 04.3
	21 10 54 20.10 ^s 0.33	8 01 55.8 ^s +0.6	1.22	0.29	.476 4539 ^s 2387	19 00.4
	22 10 54 19.77 ^s -0.22	+8 01 56.4 ^s -0.1	1.22	0.29	1.476 6926 ^s +2394	18 56.4
	23 10 54 19.55 ^s -0.10	8 01 56.3 ^s 0.9	1.22	0.29	.476 9320 ^s 2401	18 52.5
	24 10 54 19.45 ^s +0.02	8 01 55.4 ^s 1.6	1.22	0.29	.477 1721 ^s 2407	18 48.6
	25 10 54 19.47 ^s 0.15	8 01 53.8 ^s 2.4	1.22	0.29	.477 4128 ^s 2413	18 44.7
	26 10 54 19.62 ^s 0.27	8 01 51.4 ^s 3.1	1.22	0.29	.477 6541 ^s 2417	18 40.7
	27 10 54 19.89 ^s +0.39	+8 01 48.3 ^s -3.9	1.22	0.29	1.477 8958 ^s +2422	18 36.8
	28 10 54 20.28 ^s 0.51	8 01 44.4 ^s 4.6	1.22	0.29	.478 1380 ^s 2424	18 32.9
	29 10 54 20.79 ^s 0.63	8 01 39.8 ^s 5.4	1.22	0.29	.478 3804 ^s 2426	18 29.0
	30 10 54 21.42 ^s 0.76	8 01 34.4 ^s 6.1	1.21	0.29	.478 6230 ^s 2428	18 25.0
	31 10 54 22.18 ^s 0.88	8 01 28.3 ^s 6.9	1.21	0.29	.478 8658 ^s 2429	18 21.1
June	1 10 54 23.06 ^s +1.00	+8 01 21.4 ^s -7.6	1.21	0.29	1.479 1087 ^s +2429	18 17.2
	2 10 54 24.06 ^s 1.12	8 01 13.8 ^s 8.4	1.21	0.29	.479 3516 ^s 2428	18 13.3
	3 10 54 25.18 ^s 1.24	8 01 05.4 ^s 9.1	1.21	0.29	.479 5944 ^s 2428	18 09.4
	4 10 54 26.42 ^s 1.36	8 00 56.3 ^s 9.9	1.21	0.29	.479 8372 ^s 2426	18 05.5
	5 10 54 27.78 ^s 1.48	8 00 46.4 ^s 10.6	1.21	0.29	.480 0798 ^s 2423	18 01.6
	6 10 54 29.26 ^s +1.61	+8 00 35.8 ^s -11.4	1.21	0.29	1.480 3221 ^s +2420	17 57.7
	7 10 54 30.87 ^s 1.73	8 00 24.4 ^s 12.0	1.21	0.29	.480 5641 ^s 2416	17 53.7
	8 10 54 32.60 ^s 1.85	8 00 12.4 ^s 12.8	1.21	0.29	.480 8057 ^s 2411	17 49.8
	9 10 54 34.45 ^s 1.96	7 59 59.6 ^s 13.6	1.21	0.29	.481 0468 ^s 2406	17 45.9
	10 10 54 36.41 ^s 2.09	7 59 46.0 ^s 14.2	1.21	0.29	.481 2874 ^s 2400	17 42.0
	11 10 54 38.50 ^s +2.20	+7 59 31.8 ^s -15.0	1.21	0.29	1.481 5274 ^s +2394	17 38.1
	12 10 54 40.70 ^s 2.32	7 59 16.8 ^s 15.7	1.21	0.29	.481 7668 ^s 2387	17 34.3
	13 10 54 43.02 ^s 2.44	7 59 01.1 ^s 16.3	1.21	0.29	.482 0055 ^s 2379	17 30.4
	14 10 54 45.46 ^s 2.55	7 58 44.8 ^s 17.1	1.20	0.29	.482 2434 ^s 2370	17 26.5
	15 10 54 48.01 ^s 2.67	7 58 27.7 ^s 17.8	1.20	0.29	.482 4804 ^s 2360	17 22.6
	16 10 54 50.68 ^s +2.78	+7 58 09.9 ^s -18.5	1.20	0.29	1.482 7164 ^s +2351	17 18.7
	17 10 54 53.46 ^s 2.90	7 57 51.4 ^s 19.2	1.20	0.29	.482 9515 ^s 2341	17 14.8
	18 10 54 56.36 ^s 3.01	7 57 32.2 ^s 19.9	1.20	0.29	.483 1856 ^s 2330	17 10.9
	19 10 54 59.37 ^s 3.12	7 57 12.3 ^s 20.6	1.20	0.29	.483 4186 ^s 2318	17 07.1
	20 10 55 02.49 ^s 3.24	7 56 51.7 ^s 21.3	1.20	0.29	.483 6504 ^s 2307	17 03.2
	21 10 55 05.73 ^s +3.34	+7 56 30.4 ^s -21.9	1.20	0.29	1.483 8811 ^s +2294	16 59.3
	22 10 55 09.07 ^s 3.46	7 56 08.5 ^s 22.6	1.20	0.29	.484 1105 ^s 2281	16 55.4
	23 10 55 12.53 ^s 3.58	7 55 45.9 ^s 23.3	1.20	0.29	.484 3386 ^s 2267	16 51.5
	24 10 55 16.11 ^s 3.68	7 55 22.6 ^s 23.9	1.20	0.29	.484 5653 ^s 2253	16 47.7
	25 10 55 19.79 ^s 3.79	7 54 58.7 ^s 24.6	1.20	0.29	.484 7906 ^s 2239	16 43.8
	26 10 55 23.58 ^s +3.90	+7 54 34.1 ^s -25.3	1.20	0.29	1.485 0145 ^s +2223	16 39.9
	27 10 55 27.48 ^s 4.01	7 54 08.8 ^s 25.9	1.20	0.29	.485 2368 ^s 2206	16 36.1
	28 10 55 31.49 ^s 4.11	7 53 42.9 ^s 26.6	1.19	0.29	.485 4574 ^s 2190	16 32.2
	29 10 55 35.60 ^s 4.22	7 53 16.3 ^s 27.2	1.19	0.29	.485 6764 ^s 2173	16 28.3
	30 10 55 39.82 ^s 4.33	7 52 49.1 ^s 27.9	1.19	0.29	.485 8937 ^s 2155	16 24.5
July	1 10 55 44.15 ^s +4.43	+7 52 21.2 ^s -28.5	1.19	0.29	1.486 1092 ^s +2137	16 20.6
	2 10 55 48.58 ^s	+7 51 52.7 ^s	1.19	0.29	1.486 3229 ^s	16 16.8

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
July	^h ^m ^s	[°] ['] ["]	["]	["]		^h ^m
1	10 55 44.15 ^{+4.43}	+7 52 21.2 ^{-28.5}	1.19	0.29	1.486 1092 ⁺²¹³⁷	16 20.6
2	10 55 48.58 ^{4.54}	7 51 52.7 ^{29.1}	1.19	0.29	.486 3229 ²¹¹⁷	16 16.8
3	10 55 53.12 ^{4.63}	7 51 23.6 ^{29.7}	1.19	0.29	.486 5346 ²⁰⁹⁸	16 12.9
4	10 55 57.75 ^{4.74}	7 50 53.9 ^{30.3}	1.19	0.29	.486 7444 ²⁰⁷⁷	16 09.1
5	10 56 02.49 ^{4.84}	7 50 23.6 ^{31.0}	1.19	0.29	.486 9521 ²⁰⁵⁶	16 05.2
6	10 56 07.33 ^{+4.94}	+7 49 52.6 ^{-31.5}	1.19	0.29	1.487 1577 ⁺²⁰³⁵	16 01.4
7	10 56 12.27 ^{5.03}	7 49 21.1 ^{32.1}	1.19	0.29	.487 3612 ²⁰¹⁴	15 57.5
8	10 56 17.30 ^{5.13}	7 48 49.0 ^{32.7}	1.19	0.29	.487 5626 ¹⁹⁹¹	15 53.7
9	10 56 22.43 ^{5.22}	7 48 16.3 ^{33.3}	1.19	0.29	.487 7617 ¹⁹⁶⁸	15 49.8
10	10 56 27.65 ^{5.31}	7 47 43.0 ^{33.8}	1.19	0.29	.487 9585 ¹⁹⁴⁵	15 46.0
11	10 56 32.96 ^{+5.41}	+7 47 09.2 ^{-34.3}	1.19	0.29	1.488 1530 ⁺¹⁹²²	15 42.1
12	10 56 38.37 ^{5.50}	7 46 34.9 ^{34.9}	1.19	0.29	.488 3452 ¹⁸⁹⁸	15 38.3
13	10 56 43.87 ^{5.59}	7 46 00.0 ^{35.5}	1.19	0.29	.488 5350 ¹⁸⁷³	15 34.5
14	10 56 49.46 ^{5.68}	7 45 24.5 ^{36.0}	1.19	0.29	.488 7223 ¹⁸⁴⁸	15 30.6
15	10 56 55.14 ^{5.77}	7 44 48.5 ^{36.5}	1.19	0.29	.488 9071 ¹⁸²³	15 26.8
16	10 57 00.91 ^{+5.86}	+7 44 12.0 ^{-37.0}	1.19	0.29	1.489 0894 ⁺¹⁷⁹⁸	15 22.9
17	10 57 06.77 ^{5.93}	7 43 35.0 ^{37.5}	1.19	0.29	.489 2692 ¹⁷⁷¹	15 19.1
18	10 57 12.70 ^{6.02}	7 42 57.5 ^{38.0}	1.18	0.29	.489 4463 ¹⁷⁴⁵	15 15.3
19	10 57 18.72 ^{6.11}	7 42 19.5 ^{38.5}	1.18	0.29	.489 6208 ¹⁷¹⁸	15 11.5
20	10 57 24.83 ^{6.18}	7 41 41.0 ^{38.9}	1.18	0.28	.489 7926 ¹⁶⁹⁰	15 07.6
21	10 57 31.01 ^{+6.27}	+7 41 02.1 ^{-39.5}	1.18	0.28	1.489 9616 ⁺¹⁶⁶³	15 03.8
22	10 57 37.28 ^{6.35}	7 40 22.6 ^{40.0}	1.18	0.28	.490 1279 ¹⁶³⁴	14 59.9
23	10 57 43.63 ^{6.42}	7 39 42.6 ^{40.4}	1.18	0.28	.490 2913 ¹⁶⁰⁶	14 56.1
24	10 57 50.05 ^{6.50}	7 39 02.2 ^{40.9}	1.18	0.28	.490 4519 ¹⁵⁷⁷	14 52.3
25	10 57 56.55 ^{6.57}	7 38 21.3 ^{41.3}	1.18	0.28	.490 6096 ¹⁵⁴⁷	14 48.5
26	10 58 03.12 ^{+6.65}	+7 37 40.0 ^{-41.8}	1.18	0.28	1.490 7643 ⁺¹⁵¹⁸	14 44.7
27	10 58 09.77 ^{6.72}	7 36 58.2 ^{42.1}	1.18	0.28	.490 9161 ¹⁴⁸⁷	14 40.8
28	10 58 16.49 ^{6.79}	7 36 16.1 ^{42.6}	1.18	0.28	.491 0648 ¹⁴⁵⁶	14 37.0
29	10 58 23.28 ^{6.86}	7 35 33.5 ^{43.0}	1.18	0.28	.491 2104 ¹⁴²⁵	14 33.2
30	10 58 30.14 ^{6.93}	7 34 50.5 ^{43.4}	1.18	0.28	.491 3529 ¹³⁹⁴	14 29.4
31	10 58 37.07 ^{+6.99}	+7 34 07.1 ^{-43.8}	1.18	0.28	1.491 4923 ⁺¹³⁶²	14 25.6
Aug. 1	10 58 44.06 ^{7.06}	7 33 23.3 ^{44.1}	1.18	0.28	.491 6285 ¹³³⁰	14 21.7
2	10 58 51.12 ^{7.12}	7 32 39.2 ^{44.6}	1.18	0.28	.491 7615 ¹²⁹⁸	14 17.9
3	10 58 58.24 ^{7.19}	7 31 54.6 ^{44.9}	1.18	0.28	.491 8913 ¹²⁶⁵	14 14.1
4	10 59 05.43 ^{7.25}	7 31 09.7 ^{45.3}	1.18	0.28	.492 0178 ¹²³²	14 10.3
5	10 59 12.68 ^{+7.30}	+7 30 24.4 ^{-45.6}	1.18	0.28	1.492 1410 ⁺¹¹⁹⁸	14 06.5
6	10 59 19.98 ^{7.36}	7 29 38.8 ^{46.0}	1.18	0.28	.492 2608 ¹¹⁶⁴	14 02.7
7	10 59 27.34 ^{7.41}	7 28 52.8 ^{46.3}	1.18	0.28	.492 3772 ¹¹³⁰	13 58.9
8	10 59 34.75 ^{7.47}	7 28 06.5 ^{46.5}	1.18	0.28	.492 4902 ¹⁰⁹⁵	13 55.1
9	10 59 42.22 ^{7.52}	7 27 20.0 ^{46.9}	1.18	0.28	.492 5997 ¹⁰⁶¹	13 51.3
10	10 59 49.74 ^{+7.56}	+7 26 33.1 ^{-47.1}	1.18	0.28	1.492 7058 ⁺¹⁰²⁷	13 47.5
11	10 59 57.30 ^{7.62}	7 25 46.0 ^{47.4}	1.18	0.28	.492 8085 ⁹⁹²	13 43.7
12	11 00 04.92 ^{7.66}	7 24 58.6 ^{47.7}	1.18	0.28	.492 9077 ⁹⁵⁷	13 39.9
13	11 00 12.58 ^{7.71}	7 24 10.9 ^{47.9}	1.17	0.28	.493 0034 ⁹²¹	13 36.0
14	11 00 20.29 ^{7.75}	7 23 23.0 ^{48.2}	1.17	0.28	.493 0955 ⁸⁸⁶	13 32.2
15	11 00 28.04 ^{+7.79}	+7 22 34.8 ^{-48.5}	1.17	0.28	1.493 1841 ⁺⁸⁵¹	13 28.4
16	11 00 35.83	+7 21 46.3	1.17	0.28	1.493 2692	13 24.6

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Aug. 16	^h ^m ^s 11 00 35.83 +7.83	[°] ['] ["] +7 21 46.3 -48.7	1.17	0.28	I.493 2692	^h ^m 13 24.6
17	11 00 43.66 +7.87	7 20 57.6 -48.9	1.17	0.28	.493 3506 + 814	13 20.8
18	11 00 51.53 +7.91	7 20 08.7 -49.1	1.17	0.28	.493 4285 779	13 17.0
19	11 00 59.44 +7.95	7 19 19.6 -49.3	1.17	0.28	.493 5027 742	13 13.2
20	11 01 07.39 +7.98	7 18 30.3 -49.6	1.17	0.28	.493 5733 706	13 09.4
21	11 01 15.37 +8.01	+7 17 40.7 -49.7	1.17	0.28	I.493 6402 + 632	13 05.6
22	11 01 23.38 +8.05	7 16 51.0 -49.8	1.17	0.28	.493 7034 595	13 01.8
23	11 01 31.43 +8.07	7 16 01.2 -50.0	1.17	0.28	.493 7629 558	12 58.0
24	11 01 39.50 +8.10	7 15 11.2 -50.2	1.17	0.28	.493 8187 520	12 54.2
25	11 01 47.60 +8.13	7 14 21.0 -50.3	1.17	0.28	.493 8707 482	12 50.4
26	11 01 55.73 +8.15	+7 13 30.7 -50.4	1.17	0.28	I.493 9189 + 445	12 46.7
27	11 02 03.88 +8.17	7 12 40.3 -50.6	1.17	0.28	.493 9634 406	12 42.9
28	11 02 12.05 +8.19	7 11 49.7 -50.6	1.17	0.28	.494 0040 367	12 39.1
29	11 02 20.24 +8.21	7 10 59.1 -50.8	1.17	0.28	.494 0407 330	12 35.3
30	11 02 28.45 +8.22	7 10 08.3 -50.8	1.17	0.28	.494 0737 291	12 31.5
Sept. 31	11 02 36.67 +8.24	+7 09 17.5 -50.9	1.17	0.28	I.494 1028 + 252	12 27.7
1	11 02 44.91 +8.26	7 08 26.6 -51.0	1.17	0.28	.494 1280 214	12 23.9
2	11 02 53.17 +8.26	7 07 35.6 -51.0	1.17	0.28	.494 1494 175	12 20.1
3	11 03 01.43 +8.28	7 06 44.6 -51.0	1.17	0.28	.494 1669 136	12 16.3
4	11 03 09.71 +8.29	7 05 53.6 -51.1	1.17	0.28	.494 1805 98	12 12.5
5	11 03 18.00 +8.29	+7 05 02.5 -51.1	1.17	0.28	I.494 1903 + 59	12 08.7
6	11 03 26.29 +8.29	7 04 11.4 -51.0	1.17	0.28	.494 1962 + 20	12 04.9
7	11 03 34.58 +8.29	7 03 20.4 -51.1	1.17	0.28	.494 1982 - 18	12 01.1
8	11 03 42.87 +8.29	7 02 29.3 -51.0	1.17	0.28	.494 1964 56	11 57.3
9	11 03 51.16 +8.29	7 01 38.3 -51.0	1.17	0.28	.494 1908 96	11 53.5
10	11 03 59.45 +8.28	+7 00 47.3 -51.0	1.17	0.28	I.494 1812 - 134	11 49.7
11	11 04 07.73 +8.29	6 59 56.3 -50.9	1.17	0.28	.494 1678 173	11 45.9
12	11 04 16.02 +8.27	6 59 05.4 -50.8	1.17	0.28	.494 1505 212	11 42.1
13	11 04 24.29 +8.27	6 58 14.6 -50.8	1.17	0.28	.494 1293 250	11 38.3
14	11 04 32.56 +8.26	6 57 23.8 -50.6	1.17	0.28	.494 1043 289	11 34.5
15	11 04 40.82 +8.24	+6 56 33.2 -50.6	1.17	0.28	I.494 0754 - 327	11 30.7
16	11 04 49.06 +8.23	6 55 42.6 -50.5	1.17	0.28	.494 0427 366	11 26.9
17	11 04 57.29 +8.22	6 54 52.1 -50.4	1.17	0.28	.494 0061 404	11 23.1
18	11 05 05.51 +8.20	6 54 01.7 -50.2	1.17	0.28	.493 9657 443	11 19.3
19	11 05 13.71 +8.18	6 53 11.5 -50.1	1.17	0.28	.493 9214 482	11 15.5
20	11 05 21.89 +8.16	+6 52 21.4 -50.0	1.17	0.28	I.493 8732 - 520	11 11.8
21	11 05 30.05 +8.14	6 51 31.4 -49.8	1.17	0.28	.493 8212 558	11 08.0
22	11 05 38.19 +8.11	6 50 41.6 -49.6	1.17	0.28	.493 7654 597	11 04.2
23	11 05 46.30 +8.09	6 49 52.0 -49.4	1.17	0.28	.493 7057 635	11 00.4
24	11 05 54.39 +8.07	6 49 02.6 -49.3	1.17	0.28	.493 6422 672	10 56.6
25	11 06 02.46 +8.03	+6 48 13.3 -49.1	1.17	0.28	I.493 5750 - 711	10 52.8
26	11 06 10.49 +8.00	6 47 24.2 -48.8	1.17	0.28	.493 5039 749	10 49.0
27	11 06 18.49 +7.96	6 46 35.4 -48.5	1.17	0.28	.493 4290 787	10 45.2
28	11 06 26.45 +7.93	6 45 46.9 -48.3	1.17	0.28	.493 3503 825	10 41.4
29	11 06 34.38 +7.89	6 44 58.6 -48.1	1.17	0.28	.493 2678 862	10 37.6
30	11 06 42.27 +7.85	+6 44 10.5 -47.8	1.17	0.28	I.493 1816 - 899	10 33.8
Oct. 1	11 06 50.12	+6 43 22.7	1.17	0.28	I.493 0917	10 30.0

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Oct. 1	^h ^m ^s 11 06 50.12 ^{+7.81}	[°] ['] ^{''} +6 43 22.7 ^{-47.5}	['] 1.17	^{''} 0.28	1.493 0917	^h ^m 10 30.0
2	11 06 57.93 ^{7.77}	6 42 35.2 ^{47.2}	1.17	0.28	.492 9982 ⁻⁹³⁵	10 26.2
3	11 07 05.70 ^{7.72}	6 41 48.0 ^{47.0}	1.18	0.28	.492 9010 ⁹⁷²	10 22.4
4	11 07 13.42 ^{7.67}	6 41 01.0 ^{46.6}	1.18	0.28	.492 8001 ¹⁰⁰⁹	10 18.6
5	11 07 21.09 ^{7.63}	6 40 14.4 ^{46.2}	1.18	0.28	.492 6956 ¹⁰⁴⁵	10 14.8
6	11 07 28.72 ^{+7.58}	+6 39 28.2 ^{-46.0}	1.18	0.28	1.492 5874 ⁻¹¹¹⁷	10 11.0
7	11 07 36.30 ^{7.53}	6 38 42.2 ^{45.6}	1.18	0.28	.492 4757 ¹¹⁵²	10 07.2
8	11 07 43.83 ^{7.47}	6 37 56.6 ^{45.2}	1.18	0.28	.492 3605 ¹¹⁸⁸	10 03.4
9	11 07 51.30 ^{7.41}	6 37 11.4 ^{44.8}	1.18	0.28	.492 2417 ¹²²³	9 59.5
10	11 07 58.71 ^{7.36}	6 36 26.6 ^{44.5}	1.18	0.28	.492 1194 ¹²⁵⁷	9 55.7
11	11 08 06.07 ^{+7.30}	+6 35 42.1 ^{-44.1}	1.18	0.28	1.491 9937 ⁻¹²⁹²	9 51.9
12	11 08 13.37 ^{7.24}	6 34 58.0 ^{43.7}	1.18	0.28	.491 8645 ¹³²⁵	9 48.1
13	11 08 20.61 ^{7.18}	6 34 14.3 ^{43.3}	1.18	0.28	.491 7320 ¹³⁵⁹	9 44.3
14	11 08 27.79 ^{7.12}	6 33 31.0 ^{42.9}	1.18	0.28	.491 5961 ¹³⁹³	9 40.5
15	11 08 34.91 ^{7.06}	6 32 48.1 ^{42.4}	1.18	0.28	.491 4568 ¹⁴²⁶	9 36.6
16	11 08 41.97 ^{+6.99}	+6 32 05.7 ^{-42.1}	1.18	0.28	1.491 3142 ⁻¹⁴⁵⁸	9 32.8
17	11 08 48.96 ^{6.92}	6 31 23.6 ^{41.6}	1.18	0.28	.491 1684 ¹⁴⁹²	9 29.0
18	11 08 55.88 ^{6.85}	6 30 42.0 ^{41.1}	1.18	0.28	.491 0192 ¹⁵²³	9 25.2
19	11 09 02.73 ^{6.78}	6 30 00.9 ^{40.6}	1.18	0.28	.490 8669 ¹⁵⁵⁶	9 21.4
20	11 09 09.51 ^{6.71}	6 29 20.3 ^{40.2}	1.18	0.28	.490 7113 ¹⁵⁸⁸	9 17.6
21	11 09 16.22 ^{+6.63}	+6 28 40.1 ^{-39.7}	1.18	0.28	1.490 5525 ⁻¹⁶¹⁸	9 13.7
22	11 09 22.85 ^{6.55}	6 28 00.4 ^{39.2}	1.18	0.28	.490 3907 ¹⁶⁵⁰	9 09.9
23	11 09 29.40 ^{6.48}	6 27 21.2 ^{38.7}	1.18	0.28	.490 2257 ¹⁶⁸⁰	9 06.1
24	11 09 35.88 ^{6.40}	6 26 42.5 ^{38.1}	1.18	0.28	.490 0577 ¹⁷¹¹	9 02.3
25	11 09 42.28 ^{6.32}	6 26 04.4 ^{37.6}	1.18	0.28	.489 8866 ¹⁷⁴⁰	8 58.4
26	11 09 48.60 ^{+6.23}	+6 25 26.8 ^{-37.1}	1.18	0.28	1.489 7126 ⁻¹⁷⁶⁹	8 54.6
27	11 09 54.83 ^{6.15}	6 24 49.7 ^{36.5}	1.18	0.29	.489 5357 ¹⁷⁹⁸	8 50.8
28	11 10 00.98 ^{6.06}	6 24 13.2 ^{36.0}	1.18	0.29	.489 3559 ¹⁸²⁷	8 47.0
29	11 10 07.04 ^{5.98}	6 23 37.2 ^{35.4}	1.19	0.29	.489 1732 ¹⁸⁵⁵	8 43.1
30	11 10 13.02 ^{5.88}	6 23 01.8 ^{34.8}	1.19	0.29	.488 9877 ¹⁸⁸³	8 39.3
31	11 10 18.90 ^{+5.80}	+6 22 27.0 ^{-34.2}	1.19	0.29	1.488 7994 ⁻¹⁹⁰⁹	8 35.5
Nov. 1	11 10 24.70 ^{5.70}	6 21 52.8 ^{33.6}	1.19	0.29	.488 6085 ¹⁹³⁶	8 31.6
2	11 10 30.40 ^{5.61}	6 21 19.2 ^{33.0}	1.19	0.29	.488 4149 ¹⁹⁶²	8 27.8
3	11 10 36.01 ^{5.52}	6 20 46.2 ^{32.4}	1.19	0.29	.488 2187 ¹⁹⁸⁷	8 23.9
4	11 10 41.53 ^{5.42}	6 20 13.8 ^{31.8}	1.19	0.29	.488 0200 ²⁰¹¹	8 20.1
5	11 10 46.95 ^{+5.32}	+6 19 42.0 ^{-31.1}	1.19	0.29	1.487 8189 ⁻²⁰³⁵	8 16.3
6	11 10 52.27 ^{5.22}	6 19 10.9 ^{30.5}	1.19	0.29	.487 6154 ²⁰⁵⁹	8 12.4
7	11 10 57.49 ^{5.13}	6 18 40.4 ^{29.8}	1.19	0.29	.487 4095 ²⁰⁸²	8 08.6
8	11 11 02.62 ^{5.02}	6 18 10.6 ^{29.2}	1.19	0.29	.487 2013 ²¹⁰⁴	8 04.7
9	11 11 07.64 ^{4.92}	6 17 41.4 ^{28.6}	1.19	0.29	.486 9909 ²¹²⁶	8 00.9
10	11 11 12.56 ^{+4.81}	+6 17 12.8 ^{-27.9}	1.19	0.29	1.486 7783 ⁻²¹⁴⁸	7 57.0
11	11 11 17.37 ^{4.71}	6 16 44.9 ^{27.2}	1.19	0.29	.486 5635 ²¹⁶⁹	7 53.2
12	11 11 22.08 ^{4.61}	6 16 17.7 ^{26.5}	1.19	0.29	.486 3466 ²¹⁸⁹	7 49.3
13	11 11 26.69 ^{4.50}	6 15 51.2 ^{25.8}	1.19	0.29	.486 1277 ²²⁰⁹	7 45.5
14	11 11 31.19 ^{4.39}	6 15 25.4 ^{25.2}	1.19	0.29	.485 9068 ²²²⁹	7 41.6
15	11 11 35.58 ^{+4.29}	+6 15 00.2 ^{-24.4}	1.19	0.29	1.485 6839 ⁻²²⁴⁷	7 37.7
16	11 11 39.87	+6 14 35.8	1.20	0.29	1.485 4592	7 33.9

Date	Apparent Right Ascension	Apparent Declination	Semi- diam- eter	Hor. Par.	Log of True Distance from the Earth	Meri- dian Passage
Nov. 16	^h ^m ^s II II 39.87 +4.17	[°] ['] ["] +6 14 35.8 -23.7	["] 1.20	["] 0.29	I.485 4592 -2266	^h ^m 7 33.9
17	II II 44.04 4.07	6 14 12.1 23.0	1.20	0.29	.485 2326 2284	7 30.0
18	II II 48.11 3.95	6 13 49.1 22.3	1.20	0.29	.485 0042 2301	7 26.2
19	II II 52.06 3.83	6 13 26.8 21.6	1.20	0.29	.484 7741 2317	7 22.3
20	II II 55.89 3.72	6 13 05.2 20.9	1.20	0.29	.484 5424 2333	7 18.4
21	II II 59.61 +3.61	+6 12 44.3 -20.1	1.20	0.29	I.484 3091 -2347	7 14.6
22	II 12 03.22 3.49	6 12 24.2 19.3	1.20	0.29	.484 0744 2362	7 10.7
23	II 12 06.71 3.37	6 12 04.9 18.6	1.20	0.29	.483 8382 2375	7 06.8
24	II 12 10.08 3.26	6 11 46.3 17.8	1.20	0.29	.483 6007 2388	7 02.9
25	II 12 13.34 3.13	6 11 28.5 17.0	1.20	0.29	.483 3619 2401	6 59.0
26	II 12 16.47 +3.02	+6 11 11.5 -16.3	1.20	0.29	I.483 1218 -2412	6 55.1
27	II 12 19.49 2.89	6 10 55.2 15.5	1.20	0.29	.482 8806 2424	6 51.3
28	II 12 22.38 2.77	6 10 39.7 14.7	1.20	0.29	.482 6382 2433	6 47.4
29	II 12 25.15 2.65	6 10 25.0 14.0	1.20	0.29	.482 3949 2442	6 43.5
30	II 12 27.80 2.52	6 10 11.0 13.1	1.20	0.29	.482 1507 2451	6 39.6
Dec. 1	II 12 30.32 +2.40	+6 09 57.9 -12.4	1.21	0.29	I.481 9056 -2458	6 35.7
2	II 12 32.72 2.28	6 09 45.5 11.6	1.21	0.29	.481 6598 2466	6 31.8
3	II 12 35.00 2.15	6 09 33.9 10.8	1.21	0.29	.481 4132 2472	6 27.9
4	II 12 37.15 2.03	6 09 23.1 10.0	1.21	0.29	.481 1660 2478	6 24.0
5	II 12 39.18 1.90	6 09 13.1 9.2	1.21	0.29	.480 9182 2482	6 20.1
6	II 12 41.08 +1.78	+6 09 03.9 -8.4	1.21	0.29	I.480 6700 -2487	6 16.2
7	II 12 42.86 1.65	6 08 55.5 7.6	1.21	0.29	.480 4213 2490	6 12.3
8	II 12 44.51 1.52	6 08 47.9 6.8	1.21	0.29	.480 1723 2493	6 08.4
9	II 12 46.03 1.40	6 08 41.1 6.0	1.21	0.29	.479 9230 2494	6 04.5
10	II 12 47.43 1.27	6 08 35.1 5.2	1.21	0.29	.479 6736 2495	6 00.6
11	II 12 48.70 +1.15	+6 08 29.9 -4.4	1.21	0.29	I.479 4241 -2496	5 56.7
12	II 12 49.85 1.02	6 08 25.5 3.6	1.21	0.29	.479 1745 2496	5 52.8
13	II 12 50.87 0.89	6 08 21.9 2.9	1.21	0.29	.478 9249 2495	5 48.9
14	II 12 51.76 0.77	6 08 19.0 2.0	1.21	0.29	.478 6754 2493	5 45.0
15	II 12 52.53 0.63	6 08 17.0 1.2	1.22	0.29	.478 4261 2491	5 41.1
16	II 12 53.16 +0.51	+6 08 15.8 -0.4	1.22	0.29	I.478 1770 -2489	5 37.1
17	II 12 53.67 0.37	6 08 15.4 +0.4	1.22	0.29	.477 9281 2484	5 33.2
18	II 12 54.04 0.25	6 08 15.8 1.3	1.22	0.29	.477 6797 2479	5 29.3
19	II 12 54.29 +0.12	6 08 17.1 2.0	1.22	0.29	.477 4318 2474	5 25.4
20	II 12 54.41 0.00	6 08 19.1 2.9	1.22	0.29	.477 1844 2467	5 21.4
21	II 12 54.41 -0.13	+6 08 22.0 +3.7	1.22	0.29	I.476 9377 -2460	5 17.5
22	II 12 54.28 0.26	6 08 25.7 4.5	1.22	0.29	.476 6917 2451	5 13.6
23	II 12 54.02 0.39	6 08 30.2 5.2	1.22	0.29	.476 4466 2443	5 09.6
24	II 12 53.63 0.52	6 08 35.4 6.1	1.22	0.29	.476 2023 2433	5 05.7
25	II 12 53.11 0.64	6 08 41.5 6.8	1.22	0.29	.475 9590 2423	5 01.7
26	II 12 52.47 -0.77	+6 08 48.3 +7.6	1.22	0.29	I.475 7167 -2412	4 57.8
27	II 12 51.70 0.89	6 08 55.9 8.4	1.22	0.29	.475 4755 2399	4 53.9
28	II 12 50.81 1.03	6 09 04.3 9.2	1.22	0.29	.475 2356 2387	4 49.9
29	II 12 49.78 1.15	6 09 13.5 10.0	1.22	0.29	.474 9969 2372	4 45.9
30	II 12 48.63 1.27	6 09 23.5 10.8	1.23	0.29	.474 7597 2358	4 42.0
31	II 12 47.36 -1.40	+6 09 34.3 +11.6	1.23	0.30	I.474 5239 -2343	4 38.0
32	II 12 45.96	+6 09 45.9	1.23	0.30	I.474 2896	4 34.1

VENUS, 1935

AT TRANSIT AT GREENWICH

Date	Apparent Right Ascension	Sidereal Time of S.D. passing Meridian	Apparent Declination	Semi- diameter	Hori- zontal Parallax
Jan. 1	^{h m s} 19 30 14.21 +324.53	0.36	^{° ' "} -22 57 21.5 + 612.5	5.03	5.26
2	19 35 38.74 323.66	0.36	22 47 09.0 + 654.2	5.04	5.27
3	19 41 02.40 322.74	0.36	22 36 14.8 695.4	5.05	5.28
4	19 46 25.14 321.76	0.36	22 24 39.4 736.3	5.05	5.28
5	19 51 46.90 320.75	0.36	22 12 23.1 776.4	5.06	5.29
6	19 57 07.65 +319.69	0.36	-21 59 26.7 + 815.9	5.06	5.29
7	20 02 27.34 318.59	0.36	21 45 50.8 + 855.2	5.07	5.30
8	20 07 45.93 317.46	0.36	21 31 35.6 893.5	5.07	5.31
9	20 13 03.39 316.29	0.36	21 16 42.1 931.5	5.07	5.31
10	20 18 19.68 315.10	0.36	21 01 10.6 968.7	5.08	5.32
11	20 23 34.78 +313.88	0.36	-20 45 01.9 +1005.3	5.09	5.33
12	20 28 48.66 312.62	0.36	20 28 16.6 +1041.3	5.09	5.33
13	20 34 01.28 311.36	0.36	20 10 55.3 1076.5	5.10	5.34
14	20 39 12.64 310.09	0.36	19 52 58.8 1111.0	5.11	5.35
15	20 44 22.73 308.79	0.36	19 34 27.8 1144.9	5.12	5.36
16	20 49 31.52 +307.48	0.36	-19 15 22.9 +1178.0	5.12	5.36
17	20 54 39.00 306.17	0.36	18 55 44.9 1210.4	5.13	5.37
18	20 59 45.17 304.86	0.36	18 35 34.5 1242.2	5.14	5.38
19	21 04 50.03 303.54	0.36	18 14 52.3 1273.2	5.15	5.39
20	21 09 53.57 302.23	0.36	17 53 39.1 1303.3	5.16	5.40
21	21 14 55.80 +300.91	0.36	-17 31 55.8 +1332.8	5.16	5.40
22	21 19 56.71 299.60	0.36	17 09 43.0 +1361.6	5.17	5.41
23	21 24 56.31 298.31	0.36	16 47 01.4 1389.6	5.18	5.42
24	21 29 54.62 297.01	0.36	16 23 51.8 1416.6	5.19	5.43
25	21 34 51.63 295.74	0.36	16 00 15.2 1443.2	5.20	5.44
26	21 39 47.37 +294.49	0.36	-15 36 12.0 +1468.8	5.21	5.45
27	21 44 41.86 293.24	0.36	15 11 43.2 +1493.6	5.22	5.46
28	21 49 35.10 292.00	0.36	14 46 49.6 1517.8	5.23	5.47
29	21 54 27.10 290.80	0.36	14 21 31.8 1541.1	5.24	5.48
30	21 59 17.90 289.61	0.36	13 55 50.7 1563.6	5.25	5.49
31	22 04 07.51 +288.44	0.36	-13 29 47.1 +1585.4	5.26	5.50
Feb. 1	22 08 55.95 287.29	0.36	13 03 21.7 1606.3	5.27	5.51
2	22 13 43.24 286.17	0.36	12 36 35.4 1626.4	5.28	5.52
3	22 18 29.41 285.08	0.36	12 09 29.0 1645.6	5.28	5.53
4	22 23 14.49 284.01	0.36	11 42 03.4 1664.2	5.29	5.54
5	22 27 58.50 +282.96	0.36	-11 14 19.2 +1681.9	5.30	5.55
6	22 32 41.46 281.94	0.36	10 46 17.3 1698.7	5.31	5.56
7	22 37 23.40 280.95	0.36	10 17 58.6 1714.8	5.32	5.57
8	22 42 04.35 280.00	0.36	9 49 23.8 1730.1	5.33	5.58
9	22 46 44.35 279.08	0.36	9 20 33.7 1744.5	5.34	5.59
10	22 51 23.43 +278.18	0.36	-8 51 29.2 +1758.3	5.36	5.61
11	22 56 01.61 277.33	0.36	8 22 10.9 1771.2	5.37	5.62
12	23 00 38.94 276.51	0.36	7 52 39.7 1783.4	5.38	5.63
13	23 05 15.45 275.73	0.36	7 22 56.3 1794.9	5.39	5.64
14	23 09 51.18 274.99	0.36	6 53 01.4 1805.5	5.41	5.66
15	23 14 26.17 +274.30	0.36	-6 22 55.9 +1815.4	5.42	5.67
16	23 19 00.47 273.66	0.36	5 52 40.5 1825.4	5.43	5.68

VENUS, 1935

AT TRANSIT AT GREENWICH

241

Date	Apparent Right Ascension	Sidereal Time of S.D. passing Meridian	Apparent Declination	Semi- diameter	Hori- zontal Parallax
Feb. 16	^{h m s} 23 19 00.47 +273.63	0.36	— 5 52 40.5 +1824.5	5.43	5.68
17	23 23 34.10 +273.81	0.36	5 22 16.0 +1832.9	5.44	5.69
18	23 28 07.11 +272.44	0.37	4 51 43.1 +1840.5	5.46	5.71
19	23 32 39.55 +271.90	0.37	4 21 02.6 +1847.6	5.47	5.72
20	23 37 11.45 +271.41	0.37	3 50 15.0 +1853.7	5.48	5.73
21	23 41 42.86 +270.94	0.37	— 3 19 21.3 +1859.2	5.50	5.75
22	23 46 13.80 +270.56	0.37	2 48 22.1 +1864.0	5.51	5.76
23	23 50 44.36 +270.20	0.37	2 17 18.1 +1867.9	5.52	5.78
24	23 55 14.56 +269.86	0.37	1 46 10.2 +1871.1	5.53	5.79
25	23 59 44.42 +269.61	0.37	1 14 59.1 +1873.7	5.55	5.81
26	0 04 14.03 +269.36	0.37	— 0 43 45.4 +1875.5	5.56	5.82
27	0 08 43.39 +269.17	0.37	— 0 12 29.9 +1876.5	5.58	5.84
28	0 13 12.56 +269.03	0.37	+ 0 18 46.6 +1876.8	5.59	5.85
Mar. 1	0 17 41.59 +268.93	0.37	0 50 03.4 +1876.4	5.61	5.87
2	0 22 10.52 +268.87	0.37	1 21 19.8 +1875.3	5.62	5.88
3	0 26 39.39 +268.86	0.38	+ 1 52 35.1 +1873.4	5.64	5.90
4	0 31 08.25 +268.87	0.38	2 23 48.5 +1870.7	5.66	5.92
5	0 35 37.12 +268.93	0.38	2 54 59.2 +1867.2	5.67	5.93
6	0 40 06.05 +269.02	0.38	3 26 06.4 +1863.0	5.69	5.95
7	0 44 35.07 +269.15	0.38	3 57 09.4 +1858.1	5.71	5.97
8	0 49 04.22 +269.33	0.38	+ 4 28 07.5 +1852.5	5.72	5.99
9	0 53 33.55 +269.54	0.38	4 59 00.0 +1846.0	5.73	6.00
10	0 58 03.09 +269.79	0.39	5 29 46.0 +1838.9	5.75	6.02
11	1 02 32.88 +270.07	0.39	6 00 24.9 +1830.8	5.77	6.04
12	1 07 02.95 +270.39	0.39	6 30 55.7 +1822.4	5.79	6.06
13	1 11 33.34 +270.75	0.39	+ 7 01 18.1 +1812.9	5.81	6.08
14	1 16 04.09 +271.15	0.39	7 31 31.0 +1802.8	5.83	6.10
15	1 20 35.24 +271.59	0.39	8 01 33.8 +1791.9	5.85	6.12
16	1 25 06.83 +272.05	0.40	8 31 25.7 +1780.4	5.87	6.14
17	1 29 38.88 +272.56	0.40	9 01 06.1 +1768.1	5.89	6.16
18	1 34 11.44 +273.11	0.40	+ 9 30 34.2 +1755.1	5.91	6.18
19	1 38 44.55 +273.68	0.40	9 59 49.3 +1741.4	5.93	6.21
20	1 43 18.23 +274.30	0.40	10 28 50.7 +1726.9	5.95	6.23
21	1 47 52.53 +274.94	0.41	10 57 37.6 +1711.8	5.97	6.25
22	1 52 27.47 +275.62	0.41	11 26 09.4 +1695.8	5.99	6.27
23	1 57 03.09 +276.31	0.41	+ 11 54 25.2 +1679.4	6.01	6.29
24	2 01 39.40 +277.06	0.41	12 22 24.6 +1661.9	6.04	6.32
25	2 06 16.46 +277.83	0.41	12 50 06.5 +1643.8	6.06	6.34
26	2 10 54.29 +278.63	0.42	13 17 30.3 +1625.0	6.09	6.37
27	2 15 32.92 +279.45	0.42	13 44 35.3 +1605.5	6.11	6.39
28	2 20 12.37 +280.29	0.42	+ 14 11 20.8 +1585.4	6.14	6.42
29	2 24 52.66 +281.16	0.42	14 37 46.2 +1564.2	6.16	6.44
30	2 29 33.82 +282.05	0.43	15 03 50.4 +1542.6	6.18	6.47
31	2 34 15.87 +282.96	0.43	15 29 33.0 +1519.9	6.20	6.49
Apr. 1	2 38 58.83 +283.87	0.43	15 54 52.9 +1496.9	6.23	6.52
2	2 43 42.70 +284.80	0.44	+ 16 19 49.8 +1472.8	6.26	6.55
3	2 48 27.50	0.44	+ 16 44 22.6	6.29	6.58

VENUS, 1935

AT TRANSIT AT GREENWICH

Date	Apparent Right Ascension	Sidereal Time of S.D. passing Meridian	Apparent Declination	Semi- diameter	Hori- zontal Parallax
Apr. 1	^h 2 ^m 38 ^s 58.83 +283.87	0.43	+15 54 52.9 +1496.9	6.23	6.52
2	2 43 42.70 284.80	0.44	16 19 49.8 +1496.9	6.26	6.55
3	2 48 27.50 285.75	0.44	16 44 22.6 1472.8	6.29	6.58
4	2 53 13.25 286.70	0.44	17 08 30.7 1448.1	6.31	6.60
5	2 57 59.95 287.64	0.44	17 32 13.6 1422.9	6.34	6.63
6	3 02 47.59 +288.59	0.45	+17 55 30.2 1396.6	6.36	6.66
7	3 07 36.18 289.55	0.45	18 18 20.1 +1369.9	6.39	6.69
8	3 12 25.73 290.50	0.45	18 40 42.3 1342.2	6.42	6.72
9	3 17 16.23 291.43	0.45	19 02 36.3 1314.0	6.45	6.75
10	3 22 07.66 292.39	0.46	19 24 01.4 1285.1	6.48	6.78
11	3 27 00.05 +293.32	0.46	+19 44 56.8 1255.4	6.51	6.81
12	3 31 53.37 294.24	0.46	20 05 22.1 +1225.3	6.54	6.84
13	3 36 47.61 295.16	0.47	20 25 16.3 1194.2	6.58	6.88
14	3 41 42.77 296.05	0.47	20 44 38.9 1162.6	6.60	6.91
15	3 46 38.82 296.92	0.47	21 03 29.4 1130.5	6.63	6.94
16	3 51 35.74 +297.80	0.48	+21 21 47.0 1097.6	6.66	6.97
17	3 56 33.54 298.63	0.48	21 39 31.4 +1064.4	6.70	7.01
18	4 01 32.17 299.44	0.48	21 56 41.6 1030.2	6.73	7.04
19	4 06 31.61 300.24	0.49	22 13 17.4 995.8	6.77	7.08
20	4 11 31.85 300.99	0.49	22 29 18.0 960.6	6.80	7.12
21	4 16 32.84 +301.73	0.49	+22 44 43.0 925.0	6.83	7.15
22	4 21 34.57 302.43	0.50	22 59 31.8 +888.8	6.87	7.19
23	4 26 37.00 303.10	0.50	23 13 43.9 852.1	6.91	7.23
24	4 31 40.10 303.73	0.51	23 27 18.9 815.0	6.95	7.27
25	4 36 43.83 304.33	0.51	23 40 16.4 777.5	6.99	7.31
26	4 41 48.16 +304.86	0.51	+23 52 35.8 739.4	7.03	7.35
27	4 46 53.02 305.36	0.52	24 04 16.8 +701.0	7.06	7.39
28	4 51 58.38 305.81	0.52	24 15 18.8 662.0	7.10	7.43
29	4 57 04.19 306.21	0.52	24 25 41.6 622.8	7.14	7.47
30	5 02 10.40 306.56	0.53	24 35 24.8 583.2	7.19	7.52
May 1	5 07 16.96 +306.83	0.53	+24 44 28.1 543.3	7.23	7.56
2	5 12 23.79 307.06	0.53	24 52 51.2 +503.1	7.27	7.61
3	5 17 30.85 307.22	0.54	25 00 33.9 462.7	7.31	7.65
4	5 22 38.07 307.30	0.54	25 07 35.8 421.9	7.36	7.70
5	5 27 45.37 307.32	0.55	25 13 56.8 381.0	7.41	7.75
6	5 32 52.69 +307.27	0.55	+25 19 36.8 340.0	7.45	7.79
7	5 37 59.96 307.15	0.55	25 24 35.6 +298.8	7.49	7.84
8	5 43 07.11 306.97	0.56	25 28 53.0 257.4	7.55	7.90
9	5 48 14.08 306.70	0.56	25 32 29.1 216.1	7.60	7.95
10	5 53 20.78 306.36	0.56	25 35 23.8 174.7	7.64	8.00
11	5 58 27.14 +305.96	0.57	+25 37 37.0 133.2	7.69	8.05
12	6 03 33.10 305.49	0.57	25 39 08.9 +91.9	7.74	8.10
13	6 08 38.59 304.93	0.58	25 39 59.4 50.5	7.80	8.16
14	6 13 43.52 304.31	0.58	25 40 08.8 +9.4	7.85	8.22
15	6 18 47.83 303.62	0.58	25 39 37.1 -31.7	7.90	8.27
16	6 23 51.45 +302.85	0.59	+25 38 24.4 -72.7	7.96	8.33
17	6 28 54.30 302.85	0.59	+25 36 30.9 -113.5	8.02	8.39

VENUS, 1935

AT TRANSIT AT GREENWICH

243

Date	Apparent Right Ascension	Sidereal Time of S.D. passing Meridian	Apparent Declination	Semi- diameter	Hori- zontal Parallax
May 17	^h 6 ^m 28 ^s 54.30 +302.03	0.59	+25 36 30.9 -154.1	8.02	8.39
18	6 33 56.33 301.12	0.60	25 33 56.8 194.2	8.07	8.45
19	6 38 57.45 300.16	0.60	25 30 42.6 234.4	8.13	8.51
20	6 43 57.61 299.14	0.60	25 26 48.2 274.1	8.19	8.57
21	6 48 56.75 298.04	0.61	25 22 14.1 313.5	8.25	8.63
22	6 53 54.79 +296.89	0.61	+25 17 00.6 -352.6	8.31	8.70
23	6 58 51.68 295.68	0.62	25 11 08.0 391.4	8.37	8.76
24	7 03 47.36 294.41	0.62	25 04 36.6 429.7	8.44	8.83
25	7 08 41.77 293.08	0.63	24 57 26.9 467.5	8.51	8.90
26	7 13 34.85 291.70	0.63	24 49 39.4 505.0	8.57	8.97
27	7 18 26.55 +290.25	0.63	+24 41 14.4 -541.9	8.64	9.04
28	7 23 16.80 288.77	0.64	24 32 12.5 578.3	8.71	9.11
29	7 28 05.57 287.20	0.64	24 22 34.2 614.4	8.77	9.18
30	7 32 52.77 285.58	0.65	24 12 19.8 649.7	8.85	9.26
31	7 37 38.35 283.93	0.65	24 01 30.1 684.5	8.92	9.34
June 1	7 42 22.28 +282.20	0.66	+23 50 05.6 -718.7	9.00	9.42
2	7 47 04.48 280.42	0.66	23 38 06.9 752.2	9.08	9.50
3	7 51 44.90 278.61	0.67	23 25 34.7 785.3	9.15	9.58
4	7 56 23.51 276.72	0.67	23 12 29.4 817.5	9.23	9.66
5	8 01 00.23 274.81	0.67	22 58 51.9 849.1	9.32	9.75
6	8 05 35.04 +272.84	0.68	+22 44 42.8 -880.0	9.39	9.83
7	8 10 07.88 270.84	0.68	22 30 02.8 910.1	9.48	9.92
8	8 14 38.72 268.79	0.69	22 14 52.7 939.6	9.57	10.01
9	8 19 07.51 266.70	0.69	21 59 13.1 968.4	9.65	10.10
10	8 23 34.21 264.57	0.70	21 43 04.7 996.4	9.74	10.19
11	8 27 58.78 +262.40	0.70	+21 26 28.3 -1023.7	9.83	10.29
12	8 32 21.18 260.20	0.71	21 09 24.6 1050.2	9.92	10.38
13	8 36 41.38 257.97	0.71	20 51 54.4 1075.9	10.02	10.48
14	8 40 59.35 255.70	0.72	20 33 58.5 1100.9	10.12	10.59
15	8 45 15.05 253.41	0.73	20 15 37.6 1125.2	10.22	10.69
16	8 49 28.46 +251.09	0.73	+19 56 52.4 -1148.6	10.32	10.80
17	8 53 39.55 248.75	0.74	19 37 43.8 1171.4	10.42	10.91
18	8 57 48.30 246.38	0.74	19 18 12.4 1193.3	10.53	11.02
19	9 01 54.68 244.00	0.75	18 58 19.1 1214.6	10.64	11.13
20	9 05 58.68 241.58	0.76	18 38 04.5 1235.1	10.75	11.25
21	9 10 00.26 +239.14	0.76	+18 17 29.4 -1254.7	10.86	11.37
22	9 13 59.40 236.70	0.77	17 56 34.7 1273.8	10.98	11.49
23	9 17 56.10 234.22	0.78	17 35 20.9 1291.8	11.09	11.61
24	9 21 50.32 231.72	0.78	17 13 49.1 1309.3	11.21	11.73
25	9 25 42.04 229.20	0.79	16 51 59.8 1325.8	11.34	11.86
26	9 29 31.24 +226.65	0.80	+16 29 54.0 -1341.6	11.46	11.99
27	9 33 17.89 224.08	0.80	16 07 32.4 1356.6	11.59	12.12
28	9 37 01.97 221.46	0.81	15 44 55.8 1370.7	11.71	12.26
29	9 40 43.43 218.82	0.82	15 22 05.1 1383.9	11.85	12.40
30	9 44 22.25 216.14	0.83	14 59 01.2 1396.4	11.99	12.54
July 1	9 47 58.39 +213.43	0.84	+14 35 44.8 -1408.1	12.13	12.69
2	9 51 31.82 213.43	0.84	+14 12 16.7 1420.1	12.27	12.84

VENUS, 1935

AT TRANSIT AT GREENWICH

Date	Apparent Right Ascension	Sidereal Time of S.D. passing Meridian	Apparent Declination	Semi- diameter	Horiz- ontal Parallax
July 1	^{h m} 9 47 58.39 +213.43	0.84	+14 35 44.8 -1408.1	12.13	12.69
2	9 51 31.82 210.67	0.84	14 12 16.7 1418.8	12.27	12.84
3	9 55 02.49 207.87	0.85	13 48 37.9 1428.6	12.42	12.99
4	9 58 30.36 205.03	0.86	13 24 49.3 1437.5	12.56	13.15
5	10 01 55.39 202.15	0.87	13 00 51.8 1445.6	12.72	13.31
6	10 05 17.54 +199.21	0.88	+12 36 46.2 -1452.7	12.88	13.48
7	10 08 36.75 196.21	0.89	12 12 33.5 1459.1	13.04	13.65
8	10 11 52.96 193.19	0.90	11 48 14.4 1464.4	13.20	13.82
9	10 15 06.15 190.09	0.91	11 23 50.0 1469.0	13.37	13.99
10	10 18 16.24 186.92	0.92	10 59 21.0 1472.4	13.55	14.18
11	10 21 23.16 +183.70	0.93	+10 34 48.6 -1475.0	13.73	14.36
12	10 24 26.86 180.41	0.94	10 10 13.6 1476.6	13.90	14.55
13	10 27 27.27 177.07	0.95	9 45 37.0 1477.4	14.09	14.75
14	10 30 24.34 173.64	0.97	9 20 59.6 1477.1	14.28	14.95
15	10 33 17.98 170.14	0.98	8 56 22.5 1476.0	14.48	15.15
16	10 36 08.12 +166.57	0.99	+ 8 31 46.5 -1473.9	14.69	15.36
17	10 38 54.69 162.91	1.00	8 07 12.6 1470.7	14.89	15.57
18	10 41 37.60 159.19	1.02	7 42 41.9 1466.7	15.10	15.79
19	10 44 16.79 155.36	1.03	7 18 15.2 1461.6	15.31	16.02
20	10 46 52.15 151.46	1.04	6 53 53.6 1455.6	15.53	16.24
21	10 49 23.61 +147.44	1.06	+ 6 29 38.0 -1448.7	15.75	16.48
22	10 51 51.05 143.35	1.07	6 05 29.3 1440.4	15.98	16.72
23	10 54 14.40 139.12	1.09	5 41 28.9 1431.0	16.21	16.97
24	10 56 33.52 134.79	1.10	5 17 37.9 1420.6	16.46	17.22
25	10 58 48.31 130.32	1.12	4 53 57.3 1408.8	16.71	17.48
26	11 00 58.63 +125.74	1.13	+ 4 30 28.5 -1395.9	16.96	17.75
27	11 03 04.37 121.01	1.15	4 07 12.6 1381.7	17.22	18.02
28	11 05 05.38 116.11	1.17	3 44 10.9 1366.1	17.48	18.29
29	11 07 01.49 111.07	1.19	3 21 24.8 1348.9	17.75	18.58
30	11 08 52.56 105.87	1.20	2 58 55.9 1330.2	18.03	18.87
31	11 10 38.43 +100.49	1.22	+ 2 36 45.7 -1310.2	18.32	19.16
Aug. 1	11 12 18.92 94.94	1.24	2 14 55.5 1288.4	18.61	19.46
2	11 13 53.86 89.23	1.26	1 53 27.1 1265.0	18.90	19.78
3	11 15 23.09 83.30	1.28	1 32 22.1 1239.6	19.20	20.09
4	11 16 46.39 77.19	1.30	1 11 42.5 1212.8	19.51	20.41
5	11 18 03.58 + 70.88	1.32	+ 0 51 29.7 -1183.7	19.82	20.74
6	11 19 14.46 64.37	1.34	0 31 46.0 1153.0	20.14	21.07
7	11 20 18.83 57.66	1.37	+ 0 12 33.0 1119.7	20.47	21.42
8	11 21 16.49 50.76	1.39	- 0 06 06.7 1084.7	20.80	21.77
9	11 22 07.25 43.65	1.41	0 24 11.4 1047.5	21.14	22.12
10	11 22 50.90 + 36.37	1.43	- 0 41 38.9 -1008.1	21.49	22.48
11	11 23 27.27 28.88	1.46	0 58 27.0 966.3	21.84	22.85
12	11 23 56.15 21.20	1.48	1 14 33.3 922.0	22.19	23.22
13	11 24 17.35 13.41	1.50	1 29 55.3 875.5	22.54	23.58
14	11 24 30.76 + 5.45	1.53	1 44 30.8 826.5	22.90	23.96
15	11 24 36.21 - 2.65	1.55	- 1 58 17.3 775.2	23.26	24.34
16	11 24 33.56	1.58	- 2 11 12.5	23.63	24.73

VENUS, 1935

AT TRANSIT AT GREENWICH

245

Date	Apparent Right Ascension	Sidereal Time of S.D. passing Meridian	Apparent Declination	Semi- diameter	Hori- zontal Parallax
Aug. 16	^h 11 ^m 24 ^s 33.56 - ^s 10.83	1.58	- 2 11 12.5 - 721.3	23.63	24.73
17	11 24 22.73 - 19.09	1.60	2 23 13.8 - 665.0	24.00	25.11
18	11 24 03.64 - 27.40	1.62	2 34 18.8 - 606.4	24.36	25.49
19	11 23 36.24 - 35.74	1.65	2 44 25.2 - 545.1	24.73	25.88
20	11 23 00.50 - 44.07	1.68	2 53 30.3 - 481.5	25.09	26.25
21	11 22 16.43 - 52.35	1.70	- 3 01 31.8 - 415.6	25.45	26.63
22	11 21 24.08 - 60.56	1.72	3 08 27.4 - 347.5	25.80	27.00
23	11 20 23.52 - 68.62	1.75	3 14 14.9 - 277.4	26.15	27.36
24	11 19 14.90 - 76.52	1.77	3 18 52.3 - 205.3	26.50	27.72
25	11 17 58.38 - 84.17	1.79	3 22 17.6 - 131.6	26.83	28.07
26	11 16 34.21 - 91.54	1.81	- 3 24 29.2 - 56.6	27.15	28.41
27	11 15 02.67 - 98.57	1.83	3 25 25.8 - 19.7	27.46	28.73
28	11 13 24.10 - 105.18	1.85	3 25 06.1 + 96.5	27.75	29.04
29	11 11 38.92 - 111.31	1.87	3 23 29.6 - 173.4	28.03	29.33
30	11 09 47.61 - 116.94	1.89	3 20 36.2 - 250.2	28.29	29.60
31	11 07 50.67 - 121.98	1.91	- 3 16 26.0 + 326.4	28.53	29.85
Sept. 1	11 05 48.60 - 126.35	1.92	3 10 59.6 + 401.1	28.75	30.08
2	11 03 42.34 - 130.04	1.93	3 04 18.5 - 474.2	28.94	30.29
3	11 01 32.30 - 132.97	1.94	2 56 24.3 - 544.7	29.12	30.47
4	10 59 19.33 - 135.12	1.95	2 47 19.6 - 612.1	29.27	30.62
5	10 57 04.21 - 136.44	1.96	- 2 37 07.5 + 676.1	29.38	30.74
6	10 54 47.77 - 136.92	1.97	2 25 51.4 - 736.0	29.47	30.83
7	10 52 30.85 - 136.54	1.97	2 13 35.4 - 791.1	29.52	30.89
8	10 50 14.31 - 135.29	1.97	2 00 24.3 - 841.2	29.55	30.92
9	10 47 59.02 - 133.16	1.97	1 46 23.1 - 885.6	29.56	30.93
10	10 45 45.86 - 130.19	1.97	- 1 31 37.5 + 924.3	29.53	30.90
11	10 43 35.67 - 126.38	1.97	1 16 13.2 - 956.8	29.47	30.83
12	10 41 29.29 - 121.78	1.96	1 00 16.4 - 983.1	29.38	30.74
13	10 39 27.51 - 116.45	1.95	0 43 53.3 - 1003.1	29.26	30.61
14	10 37 31.06 - 110.43	1.94	0 27 10.2 - 1016.5	29.11	30.46
15	10 35 40.63 - 103.76	1.93	- 0 10 13.7 + 1024.0	28.94	30.28
16	10 33 56.87 - 96.53	1.92	+ 0 06 50.3 - 1025.5	28.74	30.08
17	10 32 20.34 - 88.82	1.90	0 23 55.8 - 1021.3	28.53	29.85
18	10 30 51.52 - 80.71	1.89	0 40 57.1 - 1011.4	28.29	29.60
19	10 29 30.81 - 72.23	1.87	0 57 48.5 - 996.7	28.04	29.34
20	10 28 18.58 - 63.47	1.85	+ 1 14 25.2 - 977.4	27.76	29.05
21	10 27 15.11 - 54.48	1.83	1 30 42.6 + 953.7	27.47	28.74
22	10 26 20.63 - 45.34	1.81	1 46 36.3 - 926.1	27.17	28.42
23	10 25 35.29 - 36.11	1.79	2 02 02.4 - 895.1	26.85	28.00
24	10 24 59.18 - 26.82	1.77	2 16 57.5 - 860.6	26.52	27.75
25	10 24 32.36 - 17.54	1.75	+ 2 31 18.1 - 823.7	26.19	27.40
26	10 24 14.82 - 8.27	1.72	2 45 01.8 + 784.2	25.84	27.04
27	10 24 06.55 + 0.91	1.70	2 58 06.0 - 742.8	25.50	26.68
28	10 24 07.46 + 9.97	1.68	3 10 28.8 - 699.3	25.15	26.31
29	10 24 17.43 - 18.90	1.66	3 22 08.1 - 654.5	24.79	25.94
30	10 24 36.33 + 27.69	1.63	+ 3 33 02.6 - 608.5	24.44	25.57
Oct. 1	10 25 04.02 + 27.69	1.61	+ 3 43 11.1 - 608.5	24.08	25.20

VENUS, 1935

AT TRANSIT AT GREENWICH

Date	Apparent Right Ascension	Sidereal Time of S.D. passing Meridian	Apparent Declination	Semi- diameter	Horiz- ontal Parallax
Oct. 1	^{h m s} 10 25 04.02 + 36.29	1.61	+ 3 43 11.1	24.08	25.20
2	10 25 40.31 + 44.68	1.58	3 52 32.6 + 561.5	23.72	24.82
3	10 26 24.99 52.86	1.56	4 01 06.1 513.5	23.37	24.45
4	10 27 17.85 60.84	1.54	4 08 51.3 465.2	23.02	24.09
5	10 28 18.69 68.59	1.52	4 15 47.6 416.3	22.67	23.72
6	10 29 27.28 + 76.12	1.49	+ 4 21 54.6 + 317.8	22.32	23.36
7	10 30 43.40 + 83.41	1.47	4 27 12.4 + 268.4	21.98	23.00
8	10 32 06.81 90.46	1.45	4 31 40.8 219.2	21.65	22.65
9	10 33 37.27 97.28	1.43	4 35 20.0 170.1	21.31	22.30
10	10 35 14.55 103.88	1.40	4 38 10.1 121.2	20.99	21.96
11	10 36 58.43 + 110.25	1.38	+ 4 40 11.3 + 72.6	20.66	21.62
12	10 38 48.68 116.38	1.36	4 41 23.9 + 24.6	20.34	21.28
13	10 40 45.06 122.29	1.34	4 41 48.5 + 22.9	20.03	20.96
14	10 42 47.35 127.97	1.32	4 41 25.6 69.9	19.72	20.64
15	10 44 55.32 133.41	1.30	4 40 15.7 116.0	19.42	20.32
16	10 47 08.73 + 138.66	1.28	+ 4 38 19.7 161.7	19.13	20.02
17	10 49 27.39 143.66	1.26	4 35 38.0 206.5	18.84	19.72
18	10 51 51.05 148.47	1.24	4 32 11.5 250.4	18.56	19.42
19	10 54 19.52 153.06	1.22	4 28 01.1 293.6	18.28	19.13
20	10 56 52.58 157.45	1.21	4 23 07.5 335.8	18.01	18.85
21	10 59 30.03 + 161.65	1.19	+ 4 17 31.7 377.1	17.75	18.57
22	11 02 11.68 165.68	1.17	4 11 14.6 417.6	17.49	18.30
23	11 04 57.36 169.52	1.15	4 04 17.0 457.1	17.24	18.04
24	11 07 46.88 173.19	1.13	3 56 39.9 495.8	16.99	17.78
25	11 10 40.07 176.70	1.12	3 48 24.1 533.7	16.75	17.53
26	11 13 36.77 + 180.06	1.10	+ 3 39 30.4 570.5	16.51	17.28
27	11 16 36.83 183.27	1.09	3 29 59.9 606.4	16.28	17.04
28	11 19 40.10 186.34	1.07	3 19 53.5 641.5	16.06	16.80
29	11 22 46.44 189.28	1.06	3 09 12.0 675.5	15.84	16.58
30	11 25 55.72 192.09	1.04	2 57 56.5 708.7	15.63	16.36
31	11 29 07.81 + 194.78	1.03	+ 2 46 07.8 741.1	15.42	16.14
Nov. 1	11 32 22.59 197.37	1.02	2 33 46.7 772.5	15.22	15.92
2	11 35 39.96 199.85	1.00	2 20 54.2 803.0	15.02	15.71
3	11 38 59.81 202.24	0.99	2 07 31.2 832.8	14.82	15.51
4	11 42 22.05 204.54	0.98	1 53 38.4 861.6	14.63	15.31
5	11 45 46.59 + 206.77	0.96	+ 1 39 16.8 889.8	14.44	15.11
6	11 49 13.36 208.92	0.95	1 24 27.0 916.9	14.26	14.92
7	11 52 42.28 210.98	0.94	1 09 10.1 943.2	14.08	14.73
8	11 56 13.26 212.99	0.93	0 53 26.9 968.7	13.91	14.55
9	11 59 46.25 214.93	0.92	0 37 18.2 993.3	13.74	14.38
10	12 03 21.18 + 216.83	0.91	+ 0 20 44.9 1017.0	13.58	14.21
11	12 06 58.01 218.66	0.90	+ 0 03 47.9 1039.9	13.42	14.04
12	12 10 36.67 220.44	0.88	- 0 13 32.0 1061.8	13.25	13.87
13	12 14 17.11 222.17	0.87	0 31 13.8 1082.9	13.09	13.70
14	12 17 59.28 223.85	0.86	0 49 16.7 1103.0	12.94	13.54
15	12 21 43.13 + 225.47	0.85	- 1 07 39.7 1122.2	12.79	13.39
16	12 25 28.60 227.00	0.84	- 1 26 21.9 1142.2	12.65	13.24

VENUS, 1935

AT TRANSIT AT GREENWICH

247

Date	Apparent Right Ascension	Sidereal Time of S.D. passing Meridian	Apparent Declination	Semi- diameter	Hori- zontal Parallax
Nov. 16	^h 12 ^m 25 ^s 28.60 +227.06	0.84	— 1° 26' 21.9" —1140.6	12.65	13.24
17	12 29 15.66 +228.61	0.83	1 45 22.5 —1157.8	12.51	13.09
18	12 33 04.27 +230.13	0.83	2 04 40.3 —1174.2	12.37	12.95
19	12 36 54.40 +231.58	0.82	2 24 14.5 —1189.7	12.24	12.81
20	12 40 45.98 +233.03	0.81	2 44 04.2 —1204.1	12.11	12.67
21	12 44 39.01 +234.45	0.80	— 3 04 08.3 —1217.9	11.97	12.53
22	12 48 33.46 +235.83	0.79	3 24 26.2 —1230.5	11.84	12.39
23	12 52 29.29 +237.20	0.78	3 44 56.7 —1242.3	11.72	12.27
24	12 56 26.49 +238.53	0.78	4 05 39.0 —1253.2	11.61	12.14
25	13 00 25.02 +239.86	0.77	4 26 32.2 —1263.0	11.49	12.02
26	13 04 24.88 +241.15	0.76	— 4 47 35.2 —1272.2	11.37	11.90
27	13 08 26.03 +242.45	0.75	5 08 47.4 —1280.3	11.26	11.78
28	13 12 28.48 +243.73	0.75	5 30 07.7 —1287.6	11.14	11.66
29	13 16 32.21 +244.99	0.74	5 51 35.3 —1294.0	11.03	11.54
30	13 20 37.20 +246.26	0.73	6 13 09.3 —1299.4	10.92	11.43
Dec. 1	13 24 43.46 +247.52	0.73	— 6 34 48.7 —1304.2	10.82	11.32
2	13 28 50.98 +248.77	0.72	6 56 32.9 —1308.1	10.71	11.21
3	13 32 59.75 +250.03	0.71	7 18 21.0 —1310.9	10.61	11.10
4	13 37 09.78 +251.30	0.71	7 40 11.9 —1313.1	10.52	11.00
5	13 41 21.08 +252.56	0.70	8 02 05.0 —1314.3	10.42	10.90
6	13 45 33.64 +253.84	0.70	— 8 23 59.3 —1314.7	10.32	10.80
7	13 49 47.48 +255.13	0.69	8 45 54.0 —1314.2	10.23	10.70
8	13 54 02.61 +256.41	0.68	9 07 48.2 —1312.9	10.14	10.61
9	13 58 19.02 +257.71	0.68	9 29 41.1 —1310.7	10.05	10.52
10	14 02 36.73 +259.01	0.67	9 51 31.8 —1307.6	9.96	10.42
11	14 06 55.74 +260.32	0.67	—10 13 19.4 —1303.6	9.87	10.33
12	14 11 16.06 +261.64	0.66	10 35 03.0 —1298.8	9.79	10.25
13	14 15 37.70 +262.97	0.66	10 56 41.8 —1293.1	9.71	10.16
14	14 20 00.67 +264.30	0.65	11 18 14.9 —1286.4	9.62	10.07
15	14 24 24.97 +265.63	0.65	11 39 41.3 —1278.9	9.55	9.99
16	14 28 50.60 +266.96	0.65	—12 01 00.2 —1270.4	9.46	9.90
17	14 33 17.56 +268.31	0.64	12 22 10.6 —1261.1	9.38	9.82
18	14 37 45.87 +269.65	0.64	12 43 11.7 —1250.8	9.31	9.74
19	14 42 15.52 +270.98	0.63	13 04 02.5 —1239.7	9.24	9.67
20	14 46 46.50 +272.33	0.63	13 24 42.2 —1227.7	9.16	9.59
21	14 51 18.83 +273.67	0.62	—13 45 09.9 —1214.9	9.09	9.51
22	14 55 52.50 +275.01	0.62	14 05 24.8 —1201.0	9.02	9.44
23	15 00 27.51 +276.35	0.62	14 25 25.8 —1186.5	8.96	9.37
24	15 05 03.86 +277.70	0.61	14 45 12.3 —1170.9	8.89	9.30
25	15 09 41.56 +279.03	0.61	15 04 43.2 —1154.6	8.82	9.23
26	15 14 20.59 +280.36	0.61	—15 23 57.8 —1137.5	8.76	9.16
27	15 19 00.95 +281.68	0.60	15 42 55.3 —1119.4	8.69	9.09
28	15 23 42.63 +283.00	0.60	16 01 34.7 —1100.5	8.63	9.03
29	15 28 25.63 +284.33	0.60	16 19 55.2 —1080.9	8.57	8.96
30	15 33 09.96 +285.64	0.59	16 37 56.1 —1060.4	8.51	8.90
31	15 37 55.60 +286.94	0.59	—16 55 36.5 —1039.2	8.45	8.84
32	15 42 42.54	0.59	—17 12 55.7	8.39	8.78

MARS, 1935

AT TRANSIT AT GREENWICH

Date	Apparent Right Ascension	Sidereal Time of S.D. passing Meridian	Apparent Declination	Semi- diameter	Horiz- ontal Parallax
Mar. 16	^{h m s} 13 29 01.46 — 48.84	0.45	— 6 08 11.0 — 274.3	6.71	12.63
17	13 28 12.62 — 51.59	0.45	6 03 36.7 — 287.3	6.76	12.73
18	13 27 21.03 — 54.28	0.46	5 58 49.4 — 300.0	6.82	12.82
19	13 26 26.75 — 56.93	0.46	5 53 49.4 — 312.4	6.87	12.92
20	13 25 29.82 — 59.51	0.46	5 48 37.0 — 324.4	6.91	13.01
21	13 24 30.31 — 62.03	0.47	— 5 43 12.6 — 336.0	6.96	13.10
22	13 23 28.28 — 64.48	0.47	5 37 36.6 — 347.1	7.01	13.18
23	13 22 23.80 — 66.85	0.47	5 31 49.5 — 357.8	7.05	13.26
24	13 21 16.95 — 69.14	0.48	5 25 51.7 — 367.9	7.09	13.34
25	13 20 07.81 — 71.32	0.48	5 19 43.8 — 377.5	7.14	13.42
26	13 18 56.49 — 73.41	0.48	— 5 13 26.3 — 386.6	7.18	13.49
27	13 17 43.08 — 75.40	0.48	5 06 59.7 — 394.8	7.22	13.57
28	13 16 27.68 — 77.26	0.49	5 00 24.9 — 402.5	7.25	13.64
29	13 15 10.42 — 78.99	0.49	4 53 42.4 — 409.3	7.29	13.70
30	13 13 51.43 — 80.61	0.49	4 46 53.1 — 415.4	7.32	13.76
31	13 12 30.82 — 82.08	0.49	— 4 39 57.7 — 420.7	7.35	13.82
Apr. 1	13 11 08.74 — 83.39	0.49	4 32 57.0 — 424.9	7.38	13.87
2	13 09 45.35 — 84.54	0.50	4 25 52.1 — 428.4	7.40	13.92
3	13 08 20.81 — 85.55	0.50	4 18 43.7 — 430.7	7.43	13.97
4	13 06 55.26 — 86.37	0.50	4 11 33.0 — 432.3	7.46	14.01
5	13 05 28.89 — 87.03	0.50	— 4 04 20.7 — 432.7	7.48	14.05
6	13 04 01.86 — 87.52	0.50	3 57 08.0 — 432.3	7.49	14.08
7	13 02 34.34 — 87.84	0.50	3 49 55.7 — 430.8	7.51	14.11
7	13 01 06.50 — 87.98	0.50	3 42 44.9 — 428.4	7.52	14.13
8	12 59 38.52 — 87.95	0.50	3 35 36.5 — 425.0	7.53	14.15
9	12 58 10.57 — 87.75	0.50	— 3 28 31.5 — 420.7	7.53	14.16
10	12 56 42.82 — 87.40	0.50	3 21 30.8 — 415.4	7.54	14.17
11	12 55 15.42 — 86.87	0.50	3 14 35.4 — 409.3	7.54	14.17
12	12 53 48.55 — 86.19	0.50	3 07 46.1 — 402.2	7.54	14.17
13	12 52 22.36 — 85.35	0.50	3 01 03.9 — 394.5	7.53	14.16
14	12 50 57.01 — 84.36	0.50	— 2 54 29.4 — 385.8	7.53	14.15
15	12 49 32.65 — 83.22	0.50	2 48 03.6 — 376.3	7.52	14.14
16	12 48 09.43 — 81.94	0.50	2 41 47.3 — 366.2	7.51	14.12
17	12 46 47.49 — 80.52	0.50	2 35 41.1 — 355.2	7.50	14.09
18	12 45 26.97 — 78.98	0.50	2 29 45.9 — 343.5	7.48	14.06
19	12 44 07.99 — 77.30	0.50	— 2 24 02.4 — 331.2	7.47	14.03
20	12 42 50.69 — 75.51	0.50	2 18 31.2 — 318.4	7.45	14.00
21	12 41 35.18 — 73.59	0.50	2 13 12.8 — 304.8	7.43	13.96
22	12 40 21.59 — 71.58	0.49	2 08 08.0 — 290.7	7.40	13.91
23	12 39 10.01 — 69.45	0.49	2 03 17.3 — 276.1	7.37	13.86
24	12 38 00.56 — 67.23	0.49	— 1 58 41.2 — 261.0	7.35	13.81
25	12 36 53.33 — 64.90	0.49	1 54 20.2 — 245.4	7.32	13.76
26	12 35 48.43 — 62.50	0.49	1 50 14.8 — 229.3	7.29	13.70
27	12 34 45.93 — 60.00	0.48	1 46 25.5 — 212.8	7.25	13.64
28	12 33 45.93 — 57.43	0.48	1 42 52.7 — 195.9	7.22	13.58
29	12 32 48.50 — 54.78	0.48	— 1 39 36.8 — 178.7	7.19	13.52
30	12 31 53.72 — 51.78	0.48	— 1 36 38.1 — 161.0	7.15	13.45

MARS, 1935

AT TRANSIT AT GREENWICH

249

Date	Apparent Right Ascension	Sidereal Time of S.D. passing Meridian	Apparent Declination	Semi- diameter	Hori- zontal Parallax
Apr. 30	^h 12 ^m 31 ^s 53.72 - ^s 52.06	0.48	- 1 36 38.1 +161.2	7.15	13.45
May 1	12 31 01.66 - 49.29	0.47	1 33 56.9 143.5	7.11	13.38
2	12 30 12.37 46.46	0.47	1 31 33.4 125.5	7.07	13.31
3	12 29 25.91 43.60	0.47	1 29 27.9 107.4	7.03	13.23
4	12 28 42.31 40.68	0.47	1 27 40.5 89.3	6.99	13.15
5	12 28 01.63 - 37.75	0.46	- 1 26 11.2 + 70.9	6.95	13.07
6	12 27 23.88 - 34.80	0.46	1 25 00.3 52.6	6.90	12.99
7	12 26 49.08 31.82	0.46	1 24 07.7 34.4	6.86	12.91
8	12 26 17.26 28.85	0.45	1 23 33.3 + 16.1	6.82	12.83
9	12 25 48.41 25.88	0.45	1 23 17.2 - 1.9	6.78	12.74
10	12 25 22.53 - 22.89	0.45	- 1 23 19.1 - 20.0	6.73	12.66
11	12 24 59.64 19.93	0.45	1 23 39.1 37.9	6.69	12.57
12	12 24 39.71 16.98	0.44	1 24 17.0 55.5	6.64	12.49
13	12 24 22.73 14.04	0.44	1 25 12.5 73.1	6.60	12.40
14	12 24 08.69 11.13	0.44	1 26 25.6 90.4	6.55	12.31
15	12 23 57.56 - 8.24	0.43	- 1 27 56.0 -107.5	6.51	12.22
16	12 23 49.32 5.36	0.43	1 29 43.5 124.5	6.46	12.14
17	12 23 43.06 - 2.53	0.43	1 31 48.0 141.1	6.41	12.05
18	12 23 41.43 + 0.29	0.42	1 34 09.1 157.7	6.37	11.96
19	12 23 41.72 3.06	0.42	1 36 46.8 173.9	6.32	11.87
20	12 23 44.78 + 5.80	0.42	- 1 39 40.7 -189.8	6.27	11.78
21	12 23 50.58 8.51	0.41	1 42 50.5 205.6	6.22	11.69
22	12 23 59.09 11.20	0.41	1 46 16.1 221.2	6.18	11.61
23	12 24 10.29 13.85	0.41	1 49 57.3 236.6	6.13	11.52
24	12 24 24.14 16.48	0.41	1 53 53.9 251.7	6.08	11.43
25	12 24 40.62 + 19.07	0.40	- 1 58 05.6 -266.6	6.04	11.34
26	12 24 59.00 21.62	0.40	2 02 32.2 281.4	6.00	11.26
27	12 25 21.31 24.16	0.40	2 07 13.6 295.8	5.95	11.17
28	12 25 45.47 26.66	0.39	2 12 09.4 310.1	5.90	11.09
29	12 26 12.13 29.13	0.39	2 17 19.5 324.2	5.86	11.01
30	12 26 41.26 + 31.55	0.39	- 2 22 43.7 -338.0	5.82	10.92
June 1	12 27 12.81 33.95	0.38	2 28 21.7 351.5	5.77	10.84
2	12 27 46.76 36.31	0.38	2 34 13.2 364.8	5.72	10.76
3	12 28 23.07 38.63	0.38	2 40 18.0 377.9	5.68	10.67
4	12 29 01.70 40.91	0.38	2 46 35.9 390.6	5.64	10.59
5	12 29 42.61 + 43.15	0.37	- 2 53 06.5 -403.1	5.59	10.51
6	12 30 25.76 45.36	0.37	2 59 49.6 415.2	5.55	10.43
7	12 31 11.12 47.51	0.37	3 06 44.8 427.2	5.51	10.35
8	12 31 58.63 49.64	0.37	3 13 52.0 438.8	5.47	10.28
9	12 32 48.27 51.71	0.36	3 21 10.8 450.1	5.43	10.20
10	12 33 39.98 + 53.76	0.36	- 3 28 40.9 -461.2	5.39	10.13
11	12 34 33.74 55.75	0.36	3 36 22.1 472.0	5.35	10.05
12	12 35 29.49 57.71	0.35	3 44 14.1 482.5	5.31	9.97
13	12 36 27.20 59.63	0.35	3 52 16.6 492.7	5.27	9.90
14	12 37 26.83 61.51	0.35	4 00 29.3 502.7	5.23	9.83
15	12 38 28.34 + 63.36	0.35	- 4 08 52.0 -512.3	5.19	9.75
16	12 39 31.70 65.36	0.35	- 4 17 24.3 -522.3	5.16	9.68

MARS, 1935

AT TRANSIT AT GREENWICH

Date	Apparent Right Ascension	Sidereal Time of S.D. passing Meridian	Apparent Declination	Semi- diameter	Hori- zontal Parallax
June 15	^h 12 ^m 39 ^s 31.70 + 65.16	0.35	— 4 17 24.3 — 521.8	5.16	9.68
16	12 40 36.86 + 66.94	0.34	4 26 06.1 — 531.0	5.12	9.61
17	12 41 43.80 68.69	0.34	4 34 57.1 540.0	5.08	9.54
18	12 42 52.49 70.39	0.34	4 43 57.1 548.8	5.04	9.47
19	12 44 02.88 72.08	0.34	4 53 05.9 557.3	5.01	9.41
20	12 45 14.96 + 73.74	0.33	— 5 02 23.2 — 565.6	4.98	9.34
21	12 46 28.70 + 75.37	0.33	5 11 48.8 573.7	4.94	9.28
22	12 47 44.07 76.98	0.33	5 21 22.5 581.8	4.90	9.22
23	12 49 01.05 78.57	0.33	5 31 04.3 589.5	4.87	9.15
24	12 50 19.62 80.14	0.32	5 40 53.8 597.2	4.84	9.09
25	12 51 39.76 + 81.68	0.32	— 5 50 51.0 — 604.5	4.81	9.02
26	12 53 01.44 + 83.22	0.32	6 00 55.5 611.8	4.77	8.96
27	12 54 24.66 84.72	0.32	6 11 07.3 618.8	4.74	8.90
28	12 55 49.38 86.21	0.32	6 21 26.1 625.6	4.71	8.84
29	12 57 15.59 87.67	0.31	6 31 51.7 632.2	4.68	8.78
30	12 58 43.26 + 89.12	0.31	— 6 42 23.9 — 638.7	4.65	8.72
July 1	13 00 12.38 + 90.54	0.31	6 53 02.6 644.8	4.62	8.67
2	13 01 42.92 91.94	0.31	7 03 47.4 650.8	4.58	8.61
3	13 03 14.86 93.32	0.31	7 14 38.2 656.5	4.55	8.55
4	13 04 48.18 94.67	0.30	7 25 34.7 662.1	4.52	8.50
5	13 06 22.85 + 96.01	0.30	— 7 36 36.8 — 667.4	4.50	8.44
6	13 07 58.86 + 97.33	0.30	7 47 44.2 672.5	4.47	8.39
7	13 09 36.19 98.62	0.30	7 58 56.7 677.5	4.44	8.34
8	13 11 14.81 99.90	0.30	8 10 14.2 682.1	4.41	8.29
9	13 12 54.71 101.16	0.30	8 21 36.3 686.5	4.38	8.23
10	13 14 35.87 + 102.40	0.29	— 8 33 02.8 — 690.8	4.35	8.18
11	13 16 18.27 + 103.61	0.29	8 44 33.6 694.8	4.33	8.13
12	13 18 01.88 104.82	0.29	8 56 08.4 698.7	4.30	8.09
13	13 19 46.70 106.00	0.29	9 07 47.1 702.2	4.28	8.04
14	13 21 32.70 107.17	0.29	9 19 29.3 705.7	4.25	7.99
15	13 23 19.87 + 108.33	0.29	— 9 31 15.0 — 708.9	4.23	7.94
16	13 25 08.20 + 109.47	0.28	9 43 03.9 712.0	4.21	7.90
17	13 26 57.67 110.60	0.28	9 54 55.9 714.9	4.18	7.85
18	13 28 48.27 111.73	0.28	10 06 50.8 717.6	4.16	7.81
19	13 30 40.00 112.84	0.28	10 18 48.4 720.1	4.13	7.76
20	13 32 32.84 + 113.95	0.28	— 10 30 48.5 — 722.5	4.11	7.72
21	13 34 26.79 + 115.06	0.28	10 42 51.0 724.8	4.09	7.68
22	13 36 21.85 116.16	0.28	10 54 55.8 726.8	4.06	7.63
23	13 38 18.01 117.26	0.27	11 07 02.6 728.7	4.04	7.59
24	13 40 15.27 118.34	0.27	11 19 11.3 730.5	4.02	7.55
25	13 42 13.61 + 119.43	0.27	— 11 31 21.8 — 732.0	4.00	7.51
26	13 44 13.04 120.50	0.27	11 43 33.8 733.3	3.98	7.47
27	13 46 13.54 121.58	0.27	11 55 47.1 734.5	3.96	7.43
28	13 48 15.12 122.64	0.27	12 08 01.6 735.6	3.94	7.39
29	13 50 17.76 123.71	0.27	12 20 17.2 736.3	3.91	7.35
30	13 52 21.47 + 124.75	0.27	— 12 32 33.5 — 737.0	3.89	7.31
31	13 54 26.22 + 124.75	0.26	— 12 44 50.5 — 737.0	3.87	7.27

MARS, 1935

AT TRANSIT AT GREENWICH

251

Date	Apparent Right Ascension	Sidereal Time of S.D. passing Meridian	Apparent Declination	Semi- diameter	Hori- zontal Parallax
July 31	^{h m s} 13 54 26.22 +125.80	0.26	^{° ' "} -12 44 50.5 -737.4	3.87	7.27
Aug. 1	13 56 32.02 126.84	0.26	12 57 07.9 737.5	3.85	7.23
2	13 58 38.86 127.86	0.26	13 09 25.4 737.6	3.83	7.20
3	14 00 46.72 128.89	0.26	13 21 43.0 737.4	3.82	7.16
4	14 02 55.61 129.90	0.26	13 34 00.4 737.0	3.80	7.13
5	14 05 05.51 +130.91	0.26	-13 46 17.4 -736.4	3.78	7.09
6	14 07 16.42 131.91	0.26	13 58 33.8 735.6	3.76	7.06
7	14 09 28.33 132.91	0.26	14 10 49.4 734.6	3.74	7.02
8	14 11 41.24 133.88	0.26	14 23 04.0 733.3	3.72	6.99
9	14 13 55.12 134.86	0.25	14 35 17.3 731.9	3.70	6.95
10	14 16 09.98 +135.84	0.25	-14 47 29.2 -730.3	3.68	6.92
11	14 18 25.82 136.79	0.25	14 59 39.5 728.5	3.67	6.89
12	14 20 42.61 137.76	0.25	15 11 48.0 726.4	3.65	6.86
13	14 23 00.37 138.71	0.25	15 23 54.4 724.2	3.64	6.82
14	14 25 19.08 139.66	0.25	15 35 58.6 721.9	3.62	6.79
15	14 27 38.74 +140.61	0.25	-15 48 00.5 -719.2	3.60	6.76
16	14 29 59.35 141.56	0.25	15 59 59.7 716.5	3.58	6.73
17	14 32 20.91 142.51	0.25	16 11 56.2 713.6	3.56	6.70
18	14 34 43.42 143.46	0.25	16 23 49.8 710.4	3.55	6.67
19	14 37 06.88 144.41	0.25	16 35 40.2 707.2	3.53	6.64
20	14 39 31.29 +145.37	0.24	-16 47 27.4 -703.6	3.52	6.61
21	14 41 56.66 146.32	0.24	16 59 11.0 700.0	3.50	6.58
22	14 44 22.98 147.28	0.24	17 10 51.0 696.2	3.49	6.55
23	14 46 50.26 148.22	0.24	17 22 27.2 692.1	3.47	6.53
24	14 49 18.48 149.18	0.24	17 33 59.3 687.8	3.46	6.50
25	14 51 47.66 +150.13	0.24	-17 45 27.1 -683.4	3.44	6.47
26	14 54 17.79 151.08	0.24	17 56 50.5 678.7	3.43	6.45
27	14 56 48.87 152.03	0.24	18 08 09.2 673.8	3.41	6.42
28	14 59 20.90 152.96	0.24	18 19 23.0 668.7	3.40	6.39
29	15 01 53.86 153.91	0.24	18 30 31.7 663.4	3.38	6.37
30	15 04 27.77 +154.84	0.24	-18 41 35.1 -657.9	3.37	6.34
31	15 07 02.61 155.76	0.24	18 52 33.0 652.2	3.36	6.31
Sept. 1	15 09 38.37 156.69	0.24	19 03 25.2 646.2	3.34	6.29
2	15 12 15.06 157.61	0.24	19 14 11.4 640.1	3.33	6.26
3	15 14 52.67 158.53	0.23	19 24 51.5 633.7	3.32	6.24
4	15 17 31.20 +159.42	0.23	-19 35 25.2 -627.1	3.31	6.21
5	15 20 10.62 160.33	0.23	19 45 52.3 620.2	3.29	6.19
6	15 22 50.95 161.22	0.23	19 56 12.5 613.2	3.28	6.17
7	15 25 32.17 162.11	0.23	20 06 25.7 606.0	3.27	6.14
8	15 28 14.28 162.99	0.23	20 16 31.7 598.6	3.25	6.12
9	15 30 57.27 +163.85	0.23	-20 26 30.3 -590.9	3.24	6.10
10	15 33 41.12 164.72	0.23	20 36 21.2 583.0	3.23	6.07
11	15 36 25.84 165.59	0.23	20 46 04.2 575.0	3.21	6.05
12	15 39 11.43 166.45	0.23	20 55 39.2 566.8	3.20	6.03
13	15 41 57.88 167.30	0.23	21 05 06.0 558.3	3.19	6.01
14	15 44 45.18 +168.15	0.23	-21 14 24.3 -549.6	3.18	5.99
15	15 47 33.33 168.99	0.23	21 23 33.9 540.0	3.17	5.96

JUPITER, 1935

AT TRANSIT AT GREENWICH

Date	Apparent Right Ascension	Sidereal Time of Eq'l. S.D. passing Meridian	Apparent Declination	Polar Semi- diameter	Hori- zontal Parallax
Apr. 13	^{h m s} 15 17 57.62 -23.42	1.52	-16 56 53.0 + 93.6	20.34	1.95
14	15 17 34.20 -23.91	1.52	16 55 19.4 + 95.4	20.38	1.95
15	15 17 10.29 -24.40	1.52	16 53 44.0 + 97.2	20.41	1.95
16	15 16 45.89 -24.88	1.53	16 52 06.8 + 99.0	20.45	1.96
17	15 16 21.01 -25.32	1.53	16 50 27.8 + 100.8	20.48	1.96
18	15 15 55.69 -25.77	1.53	-16 48 47.0 + 102.4	20.51	1.96
19	15 15 29.92 -26.18	1.53	16 47 04.6 + 104.0	20.54	1.97
20	15 15 03.74 -26.59	1.53	16 45 20.6 + 105.6	20.57	1.97
21	15 14 37.15 -26.97	1.54	16 43 35.0 + 107.0	20.60	1.97
22	15 14 10.18 -27.34	1.54	16 41 48.0 + 108.5	20.63	1.98
23	15 13 42.84 -27.69	1.54	-16 39 59.5 + 109.8	20.66	1.98
24	15 13 15.15 -28.02	1.54	16 38 09.7 + 111.1	20.68	1.98
25	15 12 47.13 -28.35	1.54	16 36 18.6 + 112.4	20.70	1.98
26	15 12 18.78 -28.64	1.55	16 34 26.2 + 113.5	20.73	1.98
27	15 11 50.14 -28.93	1.55	16 32 32.7 + 114.6	20.75	1.99
28	15 11 21.21 -29.18	1.55	-16 30 38.1 + 115.6	20.77	1.99
29	15 10 52.03 -29.42	1.55	16 28 42.5 + 116.6	20.78	1.99
30	15 10 22.61 -29.64	1.55	16 26 45.9 + 117.4	20.80	1.99
May 1	15 09 52.97 -29.83	1.55	16 24 48.5 + 118.3	20.82	1.99
2	15 09 23.14 -30.00	1.55	16 22 50.2 + 118.9	20.83	1.99
3	15 08 53.14 -30.16	1.55	-16 20 51.3 + 119.4	20.84	2.00
4	15 08 22.98 -30.28	1.55	16 18 51.9 + 120.0	20.85	2.00
5	15 07 52.70 -30.39	1.55	16 16 51.9 + 120.4	20.86	2.00
6	15 07 22.31 -30.47	1.55	16 14 51.5 + 120.8	20.87	2.00
7	15 06 51.84 -30.53	1.55	16 12 50.7 + 121.0	20.88	2.00
8	15 06 21.31 -30.58	1.55	-16 10 49.7 + 121.2	20.89	2.00
9	15 05 50.73 -30.59	1.55	16 08 48.5 + 121.3	20.89	2.00
9	15 05 20.14 -30.59	1.55	16 06 47.2 + 121.3	20.89	2.00
10	15 04 49.55 -30.56	1.55	16 04 45.9 + 121.2	20.89	2.00
11	15 04 18.99 -30.53	1.55	16 02 44.7 + 121.0	20.89	2.00
12	15 03 48.46 -30.46	1.55	-16 00 43.7 + 120.7	20.89	2.00
13	15 03 18.00 -30.37	1.55	15 58 43.0 + 120.4	20.89	2.00
14	15 02 47.63 -30.27	1.55	15 56 42.6 + 120.0	20.89	2.00
15	15 02 17.36 -30.14	1.55	15 54 42.6 + 119.5	20.88	2.00
16	15 01 47.22 -29.99	1.55	15 52 43.1 + 118.9	20.87	2.00
17	15 01 17.23 -29.83	1.55	-15 50 44.2 + 118.2	20.86	2.00
18	15 00 47.40 -29.64	1.55	15 48 46.0 + 117.4	20.85	2.00
19	15 00 17.76 -29.44	1.55	15 46 48.6 + 116.6	20.84	2.00
20	14 59 48.32 -29.22	1.55	15 44 52.0 + 115.7	20.83	1.99
21	14 59 19.10 -28.98	1.55	15 42 56.3 + 114.6	20.82	1.99
22	14 58 50.12 -28.72	1.54	-15 41 01.7 + 113.5	20.80	1.99
23	14 58 21.40 -28.45	1.54	15 39 08.2 + 112.3	20.78	1.99
24	14 57 52.95 -28.16	1.54	15 37 15.9 + 111.1	20.77	1.99
25	14 57 24.79 -27.85	1.54	15 35 24.8 + 109.7	20.75	1.99
26	14 56 56.94 -27.51	1.54	15 33 35.1 + 108.2	20.73	1.98
27	14 56 29.43 -27.16	1.53	-15 31 46.9 + 106.8	20.70	1.98
28	14 56 02.27	1.53	15 30 00.1	20.68	1.98

JUPITER, 1935

AT TRANSIT AT GREENWICH

253

Date	Apparent Right Ascension	Sidereal Time of Eq'l. S.D. passing Meridian	Apparent Declination	Polar Semi- diameter	Hori- zontal Parallax
May 28	^h 14 ^m 56 ^s 02.27 -26.78	1.53	-15 30 00.1 +105.1	20.68	1.98
29	14 55 35.49 26.40	1.53	15 28 15.0 +103.5	20.66	1.98
30	14 55 09.09 26.00	1.53	15 26 31.5 +101.7	20.63	1.98
31	14 54 43.09 25.58	1.53	15 24 49.8 99.8	20.60	1.97
June 1	14 54 17.51 25.14	1.52	15 23 10.0 97.8	20.58	1.97
2	14 53 52.37 -24.68	1.52	-15 21 32.2 +95.9	20.55	1.97
3	14 53 27.69 24.22	1.52	15 19 56.3 93.8	20.52	1.96
4	14 53 03.47 23.73	1.52	15 18 22.5 91.6	20.49	1.96
5	14 52 39.74 23.23	1.51	15 16 50.9 89.4	20.45	1.96
6	14 52 16.51 22.72	1.51	15 15 21.5 87.1	20.42	1.95
7	14 51 53.79 -22.20	1.51	-15 13 54.4 +84.7	20.38	1.95
8	14 51 31.59 21.66	1.51	15 12 29.7 82.4	20.35	1.95
9	14 51 09.93 21.11	1.50	15 11 07.3 79.9	20.31	1.94
10	14 50 48.82 20.56	1.50	15 09 47.4 77.5	20.27	1.94
11	14 50 28.26 19.98	1.50	15 08 29.9 74.9	20.24	1.94
12	14 50 08.28 -19.41	1.50	-15 07 15.0 +72.2	20.20	1.93
13	14 49 48.87 18.81	1.49	15 06 02.8 69.7	20.16	1.93
14	14 49 30.06 18.22	1.49	15 04 53.1 66.9	20.12	1.93
15	14 49 11.84 17.61	1.48	15 03 46.2 64.1	20.08	1.92
16	14 48 54.23 17.00	1.48	15 02 42.1 61.4	20.03	1.92
17	14 48 37.23 -16.37	1.48	-15 01 40.7 +58.5	19.99	1.91
18	14 48 20.86 15.75	1.47	15 00 42.2 55.7	19.95	1.91
19	14 48 05.11 15.11	1.47	14 59 46.5 52.8	19.91	1.90
20	14 47 50.00 14.46	1.47	14 58 53.7 49.8	19.86	1.90
21	14 47 35.54 13.82	1.47	14 58 03.9 46.8	19.82	1.90
22	14 47 21.72 -13.16	1.46	-14 57 17.1 +43.9	19.77	1.89
23	14 47 08.56 12.50	1.46	14 56 33.2 40.8	19.72	1.89
24	14 46 56.06 11.82	1.46	14 55 52.4 37.7	19.68	1.88
25	14 46 44.24 11.15	1.45	14 55 14.7 34.5	19.63	1.88
26	14 46 33.09 10.46	1.45	14 54 40.2 31.4	19.58	1.87
27	14 46 22.63 -9.78	1.44	-14 54 08.8 +28.3	19.53	1.87
28	14 46 12.85 9.08	1.44	14 53 40.5 25.1	19.48	1.86
29	14 46 03.77 8.38	1.44	14 53 15.4 21.9	19.43	1.86
30	14 45 55.39 7.69	1.43	14 52 53.5 18.7	19.38	1.85
July 1	14 45 47.70 6.97	1.43	14 52 34.8 15.4	19.33	1.85
2	14 45 40.73 -6.27	1.43	-14 52 19.4 +12.2	19.28	1.84
3	14 45 34.46 5.56	1.42	14 52 07.2 9.0	19.23	1.84
4	14 45 28.90 4.85	1.42	14 51 58.2 5.7	19.17	1.83
5	14 45 24.05 4.14	1.41	14 51 52.5 +2.5	19.12	1.83
6	14 45 19.91 3.42	1.41	14 51 50.0 -0.8	19.07	1.82
7	14 45 16.49 -2.71	1.41	-14 51 50.8 +4.1	19.02	1.82
8	14 45 13.78 1.99	1.40	14 51 54.9 7.3	18.96	1.81
9	14 45 11.79 1.28	1.40	14 52 02.2 10.6	18.91	1.81
10	14 45 10.51 0.56	1.39	14 52 12.8 13.8	18.86	1.80
11	14 45 09.95 +0.15	1.39	14 52 26.6 17.1	18.80	1.80
12	14 45 10.10 +0.85	1.39	-14 52 43.7 -20.3	18.75	1.79
13	14 45 10.95	1.38	-14 53 04.0	18.70	1.79

JUPITER, 1935

AT TRANSIT AT GREENWICH

Date	Apparent Right Ascension	Sidereal Time of Eq'l. S.D. passing Meridian	Apparent Declination	Polar Semi- diameter	Hori- zontal Parallax
July 13	^{h m s} 14 45 10.95 + 1.57	1.38	-14 53 04.0 - 23.5	18.70	1.79
14	14 45 12.52 2.27	1.38	14 53 27.5 - 26.7	18.64	1.78
15	14 45 14.79 2.97	1.37	14 53 54.2 29.8	18.59	1.78
16	14 45 17.76 3.68	1.37	14 54 24.0 33.0	18.53	1.77
17	14 45 21.44 4.37	1.37	14 54 57.0 36.2	18.48	1.77
18	14 45 25.81 + 5.08	1.36	-14 55 33.2 - 39.3	18.43	1.76
19	14 45 30.89 5.77	1.36	14 56 12.5 - 42.4	18.37	1.76
20	14 45 36.66 6.46	1.35	14 56 54.9 45.6	18.32	1.75
21	14 45 43.12 7.16	1.35	14 57 40.5 48.6	18.27	1.75
22	14 45 50.28 7.85	1.35	14 58 29.1 51.7	18.21	1.74
23	14 45 58.13 + 8.55	1.34	-14 59 20.8 - 54.8	18.16	1.74
24	14 46 06.68 9.23	1.34	15 00 15.6 - 57.8	18.11	1.73
25	14 46 15.91 9.92	1.33	15 01 13.4 60.8	18.05	1.73
26	14 46 25.83 10.60	1.33	15 02 14.2 63.9	18.00	1.72
27	14 46 36.43 11.29	1.33	15 03 18.1 66.9	17.95	1.72
28	14 46 47.72 + 11.96	1.32	-15 04 25.0 - 69.8	17.89	1.71
29	14 46 59.68 12.64	1.32	15 05 34.8 72.7	17.84	1.71
30	14 47 12.32 13.30	1.32	15 06 47.5 75.5	17.79	1.70
31	14 47 25.62 13.97	1.31	15 08 03.0 78.5	17.74	1.70
Aug. 1	14 47 39.59 14.63	1.31	15 09 21.5 81.2	17.68	1.69
2	14 47 54.22 + 15.29	1.31	-15 10 42.7 - 84.1	17.63	1.69
3	14 48 09.51 15.95	1.30	15 12 06.8 86.8	17.58	1.68
4	14 48 25.46 16.60	1.30	15 13 33.6 89.6	17.53	1.68
5	14 48 42.06 17.23	1.29	15 15 03.2 92.2	17.48	1.67
6	14 48 59.29 17.88	1.29	15 16 35.4 94.9	17.43	1.67
7	14 49 17.17 + 18.50	1.29	-15 18 10.3 - 97.5	17.38	1.66
8	14 49 35.67 19.14	1.28	15 19 47.8 100.1	17.33	1.66
9	14 49 54.81 19.75	1.28	15 21 27.9 102.6	17.28	1.65
10	14 50 14.56 20.36	1.28	15 23 10.5 105.0	17.23	1.65
11	14 50 34.92 20.98	1.27	15 24 55.5 107.6	17.18	1.64
12	14 50 55.90 + 21.58	1.27	-15 26 43.1 - 110.0	17.13	1.64
13	14 51 17.48 22.17	1.27	15 28 33.1 112.4	17.08	1.63
14	14 51 39.65 22.77	1.26	15 30 25.5 114.7	17.03	1.63
15	14 52 02.42 23.36	1.26	15 32 20.2 117.0	16.98	1.62
16	14 52 25.78 23.95	1.26	15 34 17.2 119.3	16.94	1.62
17	14 52 49.73 + 24.52	1.25	-15 36 16.5 - 121.4	16.89	1.62
18	14 53 14.25 25.10	1.25	15 38 17.9 123.7	16.84	1.61
19	14 53 39.35 25.68	1.25	15 40 21.6 126.0	16.79	1.61
20	14 54 05.03 26.24	1.24	15 42 27.6 128.0	16.75	1.60
21	14 54 31.27 26.80	1.24	15 44 35.6 130.1	16.70	1.60
22	14 54 58.07 + 27.36	1.24	-15 46 45.7 - 132.2	16.66	1.59
23	14 55 25.43 27.91	1.23	15 48 57.9 134.2	16.61	1.59
24	14 55 53.34 28.46	1.23	15 51 12.1 136.1	16.57	1.59
25	14 56 21.80 29.01	1.23	15 53 28.2 138.1	16.52	1.58
26	14 56 50.81 29.54	1.22	15 55 46.3 140.0	16.48	1.58
27	14 57 20.35 + 30.07	1.22	-15 58 06.3 - 141.9	16.44	1.57
28	14 57 50.42 30.61	1.22	16 00 28.2 143.9	16.40	1.57

SATURN, 1935

AT TRANSIT AT GREENWICH

255

Date	Apparent Right Ascension	Sidereal Time of Eq'l. S.D. passing Meridian	Apparent Declination	Polar Semi- diameter	Hori- zontal Parallax
Aug. 4	^h 22 ^m 44 ^s 22.29 ^a 13.84	0.64	—10 00 56.1 93.6	8.44	0.99
5	22 44 08.45 14.07	0.64	10 02 29.7 94.7	8.45	1.00
6	22 43 54.38 14.27	0.64	10 04 04.4 95.7	8.46	1.00
7	22 43 40.11 14.48	0.64	10 05 40.1 96.7	8.46	1.00
8	22 43 25.63 14.69	0.64	10 07 16.8 97.6	8.47	1.00
9	22 43 10.94 14.87	0.64	—10 08 54.4 98.5	8.48	1.00
10	22 42 56.07 15.05	0.64	10 10 32.9 99.4	8.48	1.00
11	22 42 41.02 15.23	0.64	10 12 12.3 100.1	8.49	1.00
12	22 42 25.79 15.40	0.64	10 13 52.4 100.8	8.49	1.00
13	22 42 10.39 15.57	0.64	10 15 33.2 101.5	8.50	1.00
14	22 41 54.82 15.72	0.64	—10 17 14.7 102.2	8.51	1.00
15	22 41 39.10 15.86	0.64	10 18 56.9 102.8	8.51	1.00
16	22 41 23.24 16.00	0.64	10 20 39.7 103.4	8.51	1.00
17	22 41 07.24 16.14	0.65	10 22 23.1 103.9	8.52	1.00
18	22 40 51.10 16.26	0.65	10 24 07.0 104.3	8.52	1.00
19	22 40 34.84 16.37	0.65	—10 25 51.3 104.7	8.53	1.01
20	22 40 18.47 16.49	0.65	10 27 36.0 105.1	8.53	1.01
21	22 40 01.98 16.59	0.65	10 29 21.1 105.4	8.53	1.01
22	22 39 45.39 16.68	0.65	10 31 06.5 105.6	8.54	1.01
23	22 39 28.71 16.77	0.65	10 32 52.1 105.8	8.54	1.01
24	22 39 11.94 16.85	0.65	—10 34 37.9 105.9	8.54	1.01
25	22 38 55.09 16.91	0.65	10 36 23.8 106.0	8.54	1.01
26	22 38 38.18 16.96	0.65	10 38 09.8 106.0	8.54	1.01
27	22 38 21.22 17.02	0.65	10 39 55.8 106.0	8.55	1.01
28	22 38 04.20 17.05	0.65	10 41 41.8 105.9	8.55	1.01
29	22 37 47.15 17.08	0.65	—10 43 27.7 105.7	8.55	1.01
30	22 37 30.07 17.10	0.65	10 45 13.4 105.5	8.55	1.01
31	22 37 12.97 17.11	0.65	10 46 58.9 105.2	8.55	1.01
Sept. 1	22 36 55.86 17.11	0.65	10 48 44.1 105.0	8.55	1.01
1	22 36 38.75 17.11	0.65	10 50 29.1 104.5	8.55	1.01
2	22 36 21.64 17.08	0.65	—10 52 13.6 104.1	8.55	1.01
3	22 36 04.56 17.06	0.65	10 53 57.7 103.7	8.55	1.01
4	22 35 47.50 17.02	0.65	10 55 41.4 103.1	8.55	1.01
5	22 35 30.48 16.98	0.65	10 57 24.5 102.5	8.54	1.01
6	22 35 13.50 16.93	0.65	10 59 07.0 101.8	8.54	1.01
7	22 34 56.57 16.86	0.65	—11 00 48.8 101.2	8.54	1.01
8	22 34 39.71 16.79	0.65	11 02 30.0 100.4	8.54	1.01
9	22 34 22.92 16.71	0.65	11 04 10.4 99.6	8.54	1.01
10	22 34 06.21 16.62	0.65	11 05 50.0 98.8	8.53	1.01
11	22 33 49.59 16.52	0.65	11 07 28.8 98.0	8.53	1.01
12	22 33 33.07 16.43	0.65	—11 09 06.8 97.0	8.53	1.01
13	22 33 16.64 16.31	0.65	11 10 43.8 96.0	8.52	1.00
14	22 33 00.33 16.18	0.65	11 12 19.8 95.0	8.52	1.00
15	22 32 44.15 16.06	0.65	11 13 54.8 94.0	8.51	1.00
16	22 32 28.09 15.92	0.65	11 15 28.8 92.8	8.51	1.00
17	22 32 12.17 15.78	0.65	—11 17 01.6 91.7	8.50	1.00
18	22 31 56.39 15.63	0.65	—11 18 33.3 90.6	8.50	1.00

SATURN, 1935

AT TRANSIT AT GREENWICH

Date	Apparent Right Ascension	Sidereal Time of Eq'l. S.D. passing Meridian	Apparent Declination	Polar Semi- diameter	Hori- zontal Parallax
Sept. 18	^h 22 ^m 31 ^s 56.39 — 15.62	0.65	—II 18 33.3 — 90.4	8.50	1.00
19	22 31 40.77 — 15.46	0.65	II 20 03.7 — 89.3	8.49	1.00
20	22 31 25.31 — 15.28	0.65	II 21 33.0 — 88.0	8.49	1.00
21	22 31 10.03 — 15.11	0.64	II 23 01.0 — 86.6	8.48	1.00
22	22 30 54.92 — 14.92	0.64	II 24 27.6 — 85.3	8.47	1.00
23	22 30 40.00 — 14.72	0.64	—II 25 52.9 — 83.8	8.47	1.00
24	22 30 25.28 — 14.52	0.64	II 27 16.7 — 82.3	8.46	1.00
25	22 30 10.76 — 14.31	0.64	II 28 39.0 — 80.8	8.45	1.00
26	22 29 56.45 — 14.09	0.64	II 29 59.8 — 79.2	8.45	1.00
27	22 29 42.36 — 13.86	0.64	II 31 19.0 — 77.7	8.44	0.99
28	22 29 28.50 — 13.62	0.64	—II 32 36.7 — 76.0	8.43	0.99
29	22 29 14.88 — 13.38	0.64	II 33 52.7 — 74.4	8.42	0.99
30	22 29 01.50 — 13.13	0.64	II 35 07.1 — 72.6	8.41	0.99
Oct. 1	22 28 48.37 — 12.87	0.64	II 36 19.7 — 70.9	8.41	0.99
2	22 28 35.50 — 12.61	0.64	II 37 30.6 — 69.2	8.40	0.99
3	22 28 22.89 — 12.33	0.64	—II 38 39.8 — 67.3	8.39	0.99
4	22 28 10.56 — 12.06	0.64	II 39 47.1 — 65.5	8.38	0.99
5	22 27 58.50 — 11.78	0.64	II 40 52.6 — 63.6	8.37	0.99
6	22 27 46.72 — 11.48	0.64	II 41 56.2 — 61.7	8.36	0.99
7	22 27 35.24 — 11.19	0.64	II 42 57.9 — 59.8	8.35	0.99
8	22 27 24.05 — 10.89	0.63	—II 43 57.7 — 57.9	8.34	0.98
9	22 27 13.16 — 10.58	0.63	II 44 55.6 — 55.9	8.33	0.98
10	22 27 02.58 — 10.27	0.63	II 45 51.5 — 53.9	8.32	0.98
11	22 26 52.31 — 9.96	0.63	II 46 45.4 — 52.0	8.31	0.98
12	22 26 42.35 — 9.64	0.63	II 47 37.4 — 49.9	8.30	0.98
13	22 26 32.71 — 9.31	0.63	—II 48 27.3 — 47.9	8.29	0.98
14	22 26 23.40 — 8.99	0.63	II 49 15.2 — 45.7	8.28	0.98
15	22 26 14.41 — 8.66	0.63	II 50 00.9 — 43.7	8.27	0.97
16	22 26 05.75 — 8.31	0.63	II 50 44.6 — 41.6	8.25	0.97
17	22 25 57.44 — 7.98	0.63	II 51 26.2 — 39.5	8.24	0.97
18	22 25 49.46 — 7.63	0.63	—II 52 05.7 — 37.3	8.23	0.97
19	22 25 41.83 — 7.27	0.63	II 52 43.0 — 35.2	8.22	0.97
20	22 25 34.56 — 6.92	0.63	II 53 18.2 — 33.0	8.21	0.97
21	22 25 27.64 — 6.56	0.62	II 53 51.2 — 30.7	8.20	0.96
22	22 25 21.08 — 6.19	0.62	II 54 21.9 — 28.5	8.18	0.96
23	22 25 14.89 — 5.83	0.62	—II 54 50.4 — 26.3	8.17	0.96
24	22 25 09.06 — 5.46	0.62	II 55 16.7 — 24.1	8.16	0.96
25	22 25 03.60 — 5.09	0.62	II 55 40.8 — 21.8	8.15	0.96
26	22 24 58.51 — 4.70	0.62	II 56 02.6 — 19.5	8.13	0.96
27	22 24 53.81 — 4.33	0.62	II 56 22.1 — 17.2	8.12	0.96
28	22 24 49.48 — 3.95	0.62	—II 56 39.3 — 15.0	8.11	0.96
29	22 24 45.53 — 3.56	0.62	II 56 54.3 — 12.6	8.10	0.95
30	22 24 41.97 — 3.17	0.61	II 57 06.9 — 10.3	8.08	0.95
31	22 24 38.80 — 2.78	0.61	II 57 17.2 — 8.0	8.07	0.95
Nov. 1	22 24 36.02 — 2.39	0.61	II 57 25.2 — 5.7	8.06	0.95
2	22 24 33.63 — 2.00	0.61	—II 57 30.9 — 3.3	8.04	0.95
3	22 24 31.63 — 1.61	0.61	II 57 34.2 — 1.0	8.03	0.95

SATURN, 1935

AT TRANSIT AT GREENWICH

257

Date	Apparent Right Ascension	Sidereal Time of Eq'l. S.D. passing Meridian	Apparent Declination	Polar Semi- diameter	Hori- zontal Parallax
Nov. 3	^{h m s} 22 24 31.63 - 1.61	0.61	-II 57 34.2 - 1.1	8.03	0.95
4	22 24 30.02 1.22	0.61	II 57 35.3 + 1.3	8.02	0.95
5	22 24 28.80 0.82	0.61	II 57 34.0 + 3.5	8.00	0.94
6	22 24 27.98 0.43	0.61	II 57 30.5 5.8	7.99	0.94
7	22 24 27.55 - 0.03	0.61	II 57 24.7 8.2	7.98	0.94
8	22 24 27.52 + 0.36	0.61	-II 57 16.5 + 10.5	7.96	0.94
9	22 24 27.88 + 0.76	0.61	II 57 06.0 + 12.7	7.95	0.94
10	22 24 28.64 1.15	0.60	II 56 53.3 15.1	7.94	0.94
11	22 24 29.79 1.55	0.60	II 56 38.2 17.4	7.92	0.93
12	22 24 31.34 1.94	0.60	II 56 20.8 19.6	7.91	0.93
13	22 24 33.28 + 2.34	0.60	-II 56 01.2 + 22.0	7.90	0.93
14	22 24 35.62 + 2.73	0.60	II 55 39.2 + 24.2	7.88	0.93
15	22 24 38.35 3.12	0.60	II 55 15.0 26.5	7.87	0.93
16	22 24 41.47 3.52	0.60	II 54 48.5 28.8	7.86	0.93
17	22 24 44.99 3.91	0.60	II 54 19.7 31.1	7.84	0.92
18	22 24 48.90 + 4.31	0.60	-II 53 48.6 + 33.3	7.83	0.92
19	22 24 53.21 + 4.70	0.59	II 53 15.3 + 35.7	7.81	0.92
20	22 24 57.91 5.10	0.59	II 52 39.6 37.9	7.80	0.92
21	22 25 03.01 5.49	0.59	II 52 01.7 40.1	7.79	0.92
22	22 25 08.50 5.89	0.59	II 51 21.6 42.4	7.77	0.92
23	22 25 14.39 + 6.27	0.59	-II 50 39.2 + 44.7	7.76	0.92
24	22 25 20.66 + 6.66	0.59	II 49 54.5 + 46.9	7.75	0.91
25	22 25 27.32 7.05	0.59	II 49 07.6 49.1	7.73	0.91
26	22 25 34.37 7.44	0.59	II 48 18.5 51.3	7.72	0.91
27	22 25 41.81 7.81	0.59	II 47 27.2 53.4	7.71	0.91
28	22 25 49.62 + 8.20	0.59	-II 46 33.8 + 55.7	7.69	0.91
29	22 25 57.82 + 8.58	0.58	II 45 38.1 + 57.8	7.68	0.90
30	22 26 06.40 8.95	0.58	II 44 40.3 60.0	7.67	0.90
Dec. 1	22 26 15.35 9.33	0.58	II 43 40.3 62.1	7.66	0.90
2	22 26 24.68 9.70	0.58	II 42 38.2 64.3	7.65	0.90
3	22 26 34.38 + 10.07	0.58	-II 41 33.9 + 66.3	7.63	0.90
4	22 26 44.45 10.43	0.58	II 40 27.6 + 68.4	7.62	0.90
5	22 26 54.88 10.80	0.58	II 39 19.2 70.5	7.61	0.90
6	22 27 05.68 11.15	0.58	II 38 08.7 72.4	7.59	0.89
7	22 27 16.83 11.51	0.58	II 36 56.3 74.5	7.58	0.89
8	22 27 28.34 + 11.86	0.58	-II 35 41.8 + 76.6	7.57	0.89
9	22 27 40.20 12.21	0.57	II 34 25.2 + 78.6	7.56	0.89
10	22 27 52.41 12.56	0.57	II 33 06.6 80.5	7.54	0.89
11	22 28 04.97 12.91	0.57	II 31 46.1 82.4	7.53	0.89
12	22 28 17.88 13.25	0.57	II 30 23.7 84.4	7.52	0.89
13	22 28 31.13 + 13.59	0.57	-II 28 59.3 + 86.4	7.51	0.88
14	22 28 44.72 13.92	0.57	II 27 32.9 88.2	7.50	0.88
15	22 28 58.64 14.25	0.57	II 26 04.7 90.1	7.48	0.88
16	22 29 12.89 14.58	0.57	II 24 34.6 92.1	7.47	0.88
17	22 29 27.47 14.91	0.57	II 23 02.5 93.9	7.46	0.88
18	22 29 42.38 + 15.23	0.57	-II 21 28.6 + 95.8	7.45	0.88
19	22 29 57.61 15.58	0.57	II 19 52.8 + 97.8	7.44	0.88

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(NAUTICAL ALMANAC, 1935)

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URANUS, 1935

AT TRANSIT AT GREENWICH

Date	Apparent Right Ascension	Apparent Declination	Date	Apparent Right Ascension	Apparent Declination
Jan. 1	^{h m s} I 42 55.40 ^s _{-0.86}	^{° ' "} +10 05 07.7 ^s _{-2.7}	Sept. 24	^{h m s} 2 10 45.26 ^s _{-7.33}	^{° ' "} +12 37 36.7 ^s _{-38.6}
2	I 42 54.54 ^s _{0.66}	IO 05 05.0 ^s _{1.5}	25	2 10 37.93 ^s _{7.44}	12 36 58.1 ^s _{39.3}
3	I 42 53.88 ^s _{0.47}	IO 05 03.5 ^s _{0.5}	26	2 10 30.49 ^s _{7.57}	12 36 18.8 ^s _{40.0}
4	I 42 53.41 ^s _{0.27}	IO 05 03.0 ^s _{0.7}	27	2 10 22.92 ^s _{7.69}	12 35 38.8 ^s _{40.5}
5	I 42 53.14 ^s _{-0.06}	IO 05 03.7 ^s _{1.8}	28	2 10 15.23 ^s _{7.79}	12 34 58.3 ^s _{41.1}
6	I 42 53.08 ^s _{+0.13}	+10 05 05.5 ^s _{+2.9}	29	2 10 07.44 ^s _{-7.91}	+12 34 17.2 ^s _{-41.6}
7	I 42 53.21 ^s _{0.33}	IO 05 08.4 ^s _{4.0}	30	2 09 59.53 ^s _{8.01}	12 33 35.6 ^s _{42.2}
8	I 42 53.54 ^s _{0.52}	IO 05 12.4 ^s _{5.2}	Oct. 1	2 09 51.52 ^s _{8.11}	12 32 53.4 ^s _{42.7}
9	I 42 54.06 ^s _{0.73}	IO 05 17.6 ^s _{6.4}	2	2 09 43.41 ^s _{8.21}	12 32 10.7 ^s _{43.2}
10	I 42 54.79 ^s _{0.92}	IO 05 24.0 ^s _{7.4}	3	2 09 35.20 ^s _{8.30}	12 31 27.5 ^s _{43.7}
11	I 42 55.71 ^s _{+1.11}	+10 05 31.4 ^s _{+8.6}	4	2 09 26.90 ^s _{-8.40}	+12 30 43.8 ^s _{-44.1}
12	I 42 56.82 ^s _{1.32}	IO 05 40.0 ^s _{9.7}	5	2 09 18.50 ^s _{8.48}	12 29 59.7 ^s _{44.6}
13	I 42 58.14 ^s _{1.52}	IO 05 49.7 ^s _{10.8}	6	2 09 10.02 ^s _{8.56}	12 29 15.1 ^s _{45.0}
14	I 42 59.66 ^s _{1.71}	IO 06 00.5 ^s _{11.9}	7	2 09 01.46 ^s _{8.65}	12 28 30.1 ^s _{45.5}
15	I 43 01.37 ^s _{1.91}	IO 06 12.4 ^s _{13.0}	8	2 08 52.81 ^s _{8.72}	12 27 44.6 ^s _{45.8}
16	I 43 03.28 ^s _{+2.10}	+10 06 25.4 ^s _{+14.1}	9	2 08 44.09 ^s _{-8.80}	+12 26 58.8 ^s _{-46.2}
17	I 43 05.38 ^s _{2.30}	IO 06 39.5 ^s _{15.3}	10	2 08 35.29 ^s _{8.87}	12 26 12.6 ^s _{46.6}
18	I 43 07.68 ^s _{2.49}	IO 06 54.8 ^s _{16.3}	11	2 08 26.42 ^s _{8.93}	12 25 26.0 ^s _{46.9}
19	I 43 10.17 ^s _{2.69}	IO 07 11.1 ^s _{17.4}	12	2 08 17.49 ^s _{8.99}	12 24 39.1 ^s _{47.2}
20	I 43 12.86 ^s _{2.89}	IO 07 28.5 ^s _{18.5}	13	2 08 08.50 ^s _{9.05}	12 23 51.9 ^s _{47.6}
21	I 43 15.75 ^s _{+3.08}	+10 07 47.0 ^s _{+19.6}	14	2 07 59.45 ^s _{-9.11}	+12 23 04.3 ^s _{-47.8}
22	I 43 18.83 ^s _{3.27}	IO 08 06.6 ^s _{20.7}	15	2 07 50.34 ^s _{9.16}	12 22 16.5 ^s _{48.1}
23	I 43 22.10 ^s _{3.46}	IO 08 27.3 ^s _{21.8}	16	2 07 41.18 ^s _{9.21}	12 21 28.4 ^s _{48.4}
24	I 43 25.56 ^s _{3.65}	IO 08 49.1 ^s _{22.8}	17	2 07 31.97 ^s _{9.25}	12 20 40.0 ^s _{48.5}
25	I 43 29.21 ^s _{3.84}	IO 09 11.9 ^s _{23.9}	18	2 07 22.72 ^s _{9.30}	12 19 51.5 ^s _{48.8}
26	I 43 33.05 ^s _{+4.03}	+10 09 35.8 ^s _{+25.0}	19	2 07 13.42 ^s _{-9.33}	+12 19 02.7 ^s _{-49.0}
27	I 43 37.08 ^s _{4.21}	IO 10 00.8 ^s _{26.0}	20	2 07 04.09 ^s _{9.36}	12 18 13.7 ^s _{49.1}
28	I 43 41.29 ^s _{4.41}	IO 10 26.8 ^s _{27.1}	21	2 06 54.73 ^s _{9.40}	12 17 24.6 ^s _{49.3}
29	I 43 45.70 ^s _{4.60}	IO 10 53.9 ^s _{28.1}	22	2 06 45.33 ^s _{9.41}	12 16 35.3 ^s _{49.4}
30	I 43 50.30 ^s _{4.78}	IO 11 22.0 ^s _{29.1}	23	2 06 35.92 ^s _{9.44}	12 15 45.9 ^s _{49.6}
31	I 43 55.08 ^s _{+4.97}	+10 11 51.1 ^s _{+30.2}	24	2 06 26.48 ^s _{-9.46}	+12 14 56.3 ^s _{-49.6}
Feb. 1	I 44 00.05 ^s _{5.15}	IO 12 21.3 ^s _{31.2}	24	2 06 17.02 ^s _{9.47}	12 14 06.7 ^s _{49.6}
2	I 44 05.20 ^s _{5.33}	IO 12 52.5 ^s _{32.2}	25	2 06 07.55 ^s _{9.47}	12 13 17.1 ^s _{49.7}
3	I 44 10.53 ^s _{5.52}	IO 13 24.7 ^s _{33.3}	26	2 05 58.08 ^s _{9.48}	12 12 27.4 ^s _{49.6}
4	I 44 16.05 ^s _{5.69}	IO 13 58.0 ^s _{34.3}	27	2 05 48.60 ^s _{9.48}	12 11 37.8 ^s _{49.7}
5	I 44 21.74 ^s _{+5.88}	+10 14 32.3 ^s _{+35.2}	28	2 05 39.12 ^s _{-9.47}	+12 10 48.1 ^s _{-49.6}
6	I 44 27.62 ^s _{6.05}	IO 15 07.5 ^s _{36.2}	29	2 05 29.65 ^s _{9.47}	12 09 58.5 ^s _{49.6}
7	I 44 33.67 ^s _{6.22}	IO 15 43.7 ^s _{37.1}	30	2 05 20.18 ^s _{9.45}	12 09 08.9 ^s _{49.5}
8	I 44 39.89 ^s _{6.40}	IO 16 20.8 ^s _{38.1}	31	2 05 10.73 ^s _{9.43}	12 08 19.4 ^s _{49.4}
9	I 44 46.29 ^s _{6.57}	IO 16 58.9 ^s _{39.1}	Nov. 1	2 05 01.30 ^s _{9.41}	12 07 30.0 ^s _{49.3}
10	I 44 52.86 ^s _{+6.74}	+10 17 38.0 ^s _{+40.0}	2	2 04 51.89 ^s _{-9.38}	+12 06 40.7 ^s _{-49.2}
11	I 44 59.60 ^s _{6.90}	IO 18 18.0 ^s _{40.9}	3	2 04 42.51 ^s _{9.35}	12 05 51.5 ^s _{48.9}
12	I 45 06.50 ^s _{7.08}	IO 18 58.9 ^s _{41.8}	4	2 04 33.16 ^s _{9.32}	12 05 02.6 ^s _{48.8}
13	I 45 13.58 ^s _{+7.23}	IO 19 40.7 ^s _{+42.7}	5	2 04 23.84 ^s _{-9.28}	12 04 13.8 ^s _{-48.6}
14	I 45 20.81 ^s _{+7.23}	+10 20 23.4 ^s _{+42.7}	6	2 04 14.56 ^s _{-9.28}	+12 03 25.2 ^s _{-48.6}

The sidereal time of semi-diameter passing the meridian is 0^h12.
For semi-diameter and horizontal parallax, see pages 224-231.

URANUS, 1935

AT TRANSIT AT GREENWICH

259

Date	Apparent Right Ascension	Apparent Declination	Date	Apparent Right Ascension	Apparent Declination
Nov. 6	^h 2 ^m 04 ^s 14.56 [°] -9.23	+12 03 25.2 ['] -48.3	Dec. 20	^h 1 ^m 58 ^s 59.36 [°] -3.96	+11 36 16.2 ['] -19.5
7	2 04 05.33 [°] 9.20	12 02 36.9 ['] 48.1	21	1 58 55.40 [°] 3.78	11 35 56.7 ['] 18.5
8	2 03 56.13 [°] 9.14	12 01 48.8 ['] 47.8	22	1 58 51.62 [°] 3.60	11 35 38.2 ['] 17.6
9	2 03 46.99 [°] 9.09	12 01 01.0 ['] 47.5	23	1 58 48.02 [°] 3.41	11 35 20.6 ['] 16.5
10	2 03 37.90 [°] 9.02	12 00 13.5 ['] 47.2	24	1 58 44.61 [°] 3.23	11 35 04.1 ['] 15.5
11	2 03 28.88 [°] -8.97	+11 59 26.3 ['] -46.9	25	1 58 41.38 [°] -3.04	+11 34 48.6 ['] -14.5
12	2 03 19.91 [°] 8.91	11 58 39.4 ['] 46.5	26	1 58 38.34 [°] 2.85	11 34 34.1 ['] 13.5
13	2 03 11.00 [°] 8.83	11 57 52.9 ['] 46.2	27	1 58 35.49 [°] 2.66	11 34 20.6 ['] 12.3
14	2 03 02.17 [°] 8.77	11 57 06.7 ['] 45.8	28	1 58 32.83 [°] 2.47	11 34 08.3 ['] 11.4
15	2 02 53.40 [°] 8.69	11 56 20.9 ['] 45.4	29	1 58 30.36 [°] 2.28	11 33 56.9 ['] 10.3
16	2 02 44.71 [°] -8.61	+11 55 35.5 ['] -44.9	30	1 58 28.08 [°] -2.08	+11 33 46.6 ['] -9.2
17	2 02 36.10 [°] 8.53	11 54 50.6 ['] 44.4	31	1 58 26.00 [°] -1.89	11 33 37.4 ['] -8.2
18	2 02 27.57 [°] 8.44	11 54 06.2 ['] 44.0	32	1 58 24.11 [°] -1.89	+11 33 29.2 ['] -8.2
19	2 02 19.13 [°] 8.35	11 53 22.2 ['] 43.5			
20	2 02 10.78 [°] 8.25	11 52 38.7 ['] 42.9			
21	2 02 02.53 [°] -8.15	+11 51 55.8 ['] -42.5			
22	2 01 54.38 [°] 8.05	11 51 13.3 ['] 41.8			
23	2 01 46.33 [°] 7.95	11 50 31.5 ['] 41.3			
24	2 01 38.38 [°] 7.84	11 49 50.2 ['] 40.7			
25	2 01 30.54 [°] 7.72	11 49 09.5 ['] 40.1			
26	2 01 22.82 [°] -7.61	+11 48 29.4 ['] -39.4			
27	2 01 15.21 [°] 7.48	11 47 50.0 ['] 38.8			
28	2 01 07.73 [°] 7.36	11 47 11.2 ['] 38.1			
29	2 01 00.37 [°] 7.24	11 46 33.1 ['] 37.4			
30	2 00 53.13 [°] 7.10	11 45 55.7 ['] 36.7			
Dec. 1	2 00 46.03 [°] -6.97	+11 45 19.0 ['] -36.0			
2	2 00 39.06 [°] 6.83	11 44 43.0 ['] 35.2			
3	2 00 32.23 [°] 6.69	11 44 07.8 ['] 34.4			
4	2 00 25.54 [°] 6.55	11 43 33.4 ['] 33.7			
5	2 00 18.99 [°] 6.41	11 42 59.7 ['] 32.9			
6	2 00 12.58 [°] -6.27	+11 42 26.8 ['] -32.1			
7	2 00 06.31 [°] 6.11	11 41 54.7 ['] 31.3			
8	2 00 00.20 [°] 5.96	11 41 23.4 ['] 30.4			
9	1 59 54.24 [°] 5.80	11 40 53.0 ['] 29.7			
10	1 59 48.44 [°] 5.65	11 40 23.3 ['] 28.7			
11	1 59 42.79 [°] -5.49	+11 39 54.6 ['] -27.9			
12	1 59 37.30 [°] 5.33	11 39 26.7 ['] 27.1			
13	1 59 31.97 [°] 5.17	11 38 59.6 ['] 26.1			
14	1 59 26.80 [°] 5.00	11 38 33.5 ['] 25.3			
15	1 59 21.80 [°] 4.83	11 38 08.2 ['] 24.3			
16	1 59 16.97 [°] -4.66	+11 37 43.9 ['] -23.3			
17	1 59 12.31 [°] 4.49	11 37 20.6 ['] 22.4			
18	1 59 07.82 [°] 4.32	11 36 58.2 ['] 21.5			
19	1 59 03.50 [°] -4.14	11 36 36.7 ['] -20.5			
20	1 58 59.36 [°] -4.14	+11 36 16.2 ['] -20.5			

The sidereal time of semi-diameter passing the meridian is 0^h 12.
For semi-diameter and horizontal parallax, see pages 224-231.

NEPTUNE, 1935

AT TRANSIT AT GREENWICH

Date	Apparent Right Ascension	Apparent Declination	Date	Apparent Right Ascension	Apparent Declination
Feb. 6	^{h m s} 11 02 15.19 -5.31	^{° ' "} +7 13 18.5 +34.7	Mar. 21	^{h m s} 10 57 52.99 -5.84	^{° ' "} +7 40 59.9 +36.0
7	11 02 09.88 5.38	7 13 53.2 35.0	22	10 57 47.15 5.79	7 41 35.9 35.7
8	11 02 04.50 5.43	7 14 28.2 35.4	23	10 57 41.36 5.75	7 42 11.6 35.4
9	11 01 59.07 5.49	7 15 03.6 35.7	24	10 57 35.61 5.71	7 42 47.0 35.0
10	11 01 53.58 5.55	7 15 39.3 36.0	25	10 57 29.90 5.66	7 43 22.0 34.7
11	11 01 48.03 -5.60	+7 16 15.3 +36.3	26	10 57 24.24 -5.61	+7 43 56.7 +34.4
12	11 01 42.43 5.65	7 16 51.6 36.5	27	10 57 18.63 5.55	7 44 31.1 34.0
13	11 01 36.78 5.71	7 17 28.1 36.8	28	10 57 13.08 5.50	7 45 05.1 33.6
14	11 01 31.07 5.75	7 18 04.9 37.1	29	10 57 07.58 5.44	7 45 38.7 33.2
15	11 01 25.32 5.79	7 18 42.0 37.3	30	10 57 02.14 5.38	7 46 11.9 32.8
16	11 01 19.53 -5.84	+7 19 19.3 +37.5	31	10 56 56.76 -5.32	+7 46 44.7 +32.4
17	11 01 13.69 5.88	7 19 56.8 37.7	Apr. 1	10 56 51.44 5.26	7 47 17.1 32.0
18	11 01 07.81 5.91	7 20 34.5 37.9	2	10 56 46.18 5.19	7 47 49.1 31.5
19	11 01 01.90 5.95	7 21 12.4 38.1	3	10 56 40.99 5.13	7 48 20.6 31.1
20	11 00 55.95 5.99	7 21 50.5 38.3	4	10 56 35.86 5.05	7 48 51.7 30.6
21	11 00 49.96 -6.01	+7 22 28.8 +38.4	5	10 56 30.81 -4.99	+7 49 22.3 +30.1
22	11 00 43.95 6.05	7 23 07.2 38.6	6	10 56 25.82 4.91	7 49 52.4 29.6
23	11 00 37.90 6.07	7 23 45.8 38.6	7	10 56 20.91 4.83	7 50 22.0 29.1
24	11 00 31.83 6.09	7 24 24.4 38.8	8	10 56 16.08 4.75	7 50 51.1 28.6
25	11 00 25.74 6.12	7 25 03.2 38.9	9	10 56 11.33 4.68	7 51 19.7 28.1
26	11 00 19.62 -6.14	+7 25 42.1 +38.9	10	10 56 06.65 -4.60	+7 51 47.8 +27.6
27	11 00 13.48 6.15	7 26 21.0 39.0	11	10 56 02.05 4.51	7 52 15.4 27.0
28	11 00 07.33 6.16	7 27 00.0 39.0	12	10 55 57.54 4.43	7 52 42.4 26.4
Mar. 1	11 00 01.17 6.17	7 27 39.0 39.1	13	10 55 53.11 4.34	7 53 08.8 25.9
2	10 59 55.00 6.19	7 28 18.1 39.0	14	10 55 48.77 4.26	7 53 34.7 25.4
3	10 59 48.81 -6.19	+7 28 57.1 +39.1	15	10 55 44.51 -4.17	+7 54 00.1 +24.7
4	10 59 42.62 6.19	7 29 36.2 39.0	16	10 55 40.34 4.08	7 54 24.8 24.2
5	10 59 36.43 6.20	7 30 15.2 39.0	17	10 55 36.26 3.98	7 54 49.0 23.6
6	10 59 30.23 6.20	7 30 54.2 38.9	18	10 55 32.28 3.89	7 55 12.6 23.0
7	10 59 24.03 6.19	7 31 33.1 38.9	19	10 55 28.39 3.80	7 55 35.6 22.4
8	10 59 17.84 -6.19	+7 32 12.0 +38.8	20	10 55 24.59 -3.70	+7 55 58.0 +21.7
8	10 59 11.65 6.17	7 32 50.8 38.6	21	10 55 20.89 3.60	7 56 19.7 21.2
9	10 59 05.48 6.17	7 33 29.4 38.6	22	10 55 17.29 3.51	7 56 40.9 20.5
10	10 58 59.31 6.15	7 34 08.0 38.4	23	10 55 13.78 3.40	7 57 01.4 19.9
11	10 58 53.16 6.13	7 34 46.4 38.2	24	10 55 10.38 3.31	7 57 21.3 19.2
12	10 58 47.03 -6.11	+7 35 24.6 +38.1	25	10 55 07.07 -3.21	+7 57 40.5 +18.6
13	10 58 40.92 6.09	7 36 02.7 37.9	26	10 55 03.86 3.10	7 57 59.1 18.0
14	10 58 34.83 6.07	7 36 40.6 37.7	27	10 55 00.76 3.00	7 58 17.1 17.3
15	10 58 28.76 6.04	7 37 18.3 37.5	28	10 54 57.76 2.89	7 58 34.4 16.6
16	10 58 22.72 6.01	7 37 55.8 37.3	29	10 54 54.87 2.79	7 58 51.0 15.9
17	10 58 16.71 -5.98	+7 38 33.1 +37.1	30	10 54 52.08 -2.68	+7 59 06.9 +15.2
18	10 58 10.73 5.95	7 39 10.2 36.8	May 1	10 54 49.40 2.56	7 59 22.1 14.5
19	10 58 04.78 5.91	7 39 47.0 36.6	2	10 54 46.84 2.46	7 59 36.6 13.9
20	10 57 58.87 -5.88	+7 40 23.6 +36.3	3	10 54 44.38 -2.35	+7 59 50.5 +13.1
21	10 57 52.99	+7 40 59.9	4	10 54 42.03	+8 00 03.6

The sidereal time of semi-diameter passing the meridian is 0^h08.
For semi-diameter and horizontal parallax, see pages 232-235.

NEPTUNE, 1935

AT TRANSIT AT GREENWICH

261

Date	Apparent Right Ascension	Apparent Declination	Date	Apparent Right Ascension	Apparent Declination
May 4	^{h m s} 10 54 42.03 ^s	^{° ' "} +8 00 03.6 ["]	May 18	^{h m s} 10 54 21.27 ^s	^{° ' "} +8 01 51.9 ["]
5	10 54 39.80 ^{-2.23}	8 00 16.0 ^{+12.4}	19	10 54 20.67 ^{-0.60}	8 01 54.1 ^{+2.2}
6	10 54 37.68 ^{2.12}	8 00 27.7 ^{11.7}	20	10 54 20.19 ^{0.48}	8 01 55.6 ^{1.5}
7	10 54 35.67 ^{2.01}	8 00 38.7 ^{11.0}	21	10 54 19.83 ^{0.36}	8 01 56.4 ^{+0.8}
8	10 54 33.78 ^{1.89}	8 00 49.0 ^{10.3}	22	10 54 19.58 ^{0.25}	8 01 56.4 ^{0.0}
	1.78	9.5		-0.12	0.7
9	10 54 32.00 ^{-1.66}	+8 00 58.5 ^{+8.9}	23	10 54 19.46 ^{0.00}	+8 01 55.7 ^{-1.5}
10	10 54 30.34 ^{1.54}	8 01 07.4 ^{8.1}	24	10 54 19.46 ^{+0.12}	8 01 54.2 ^{2.2}
11	10 54 28.80 ^{1.43}	8 01 15.5 ^{7.4}	25	10 54 19.58 ^{0.24}	8 01 52.0 ^{2.9}
12	10 54 27.37 ^{1.31}	8 01 22.9 ^{6.6}	26	10 54 19.82 ^{0.36}	8 01 49.1 ^{3.7}
13	10 54 26.06 ^{1.19}	8 01 29.5 ^{5.9}	27	10 54 20.18 ^{0.48}	8 01 45.4 ^{4.5}
14	10 54 24.87 ^{-1.08}	+8 01 35.4 ^{+5.2}	28	10 54 20.66 ^{+0.60}	+8 01 40.9 ^{-5.2}
15	10 54 23.79 ^{0.96}	8 01 40.6 ^{4.5}	29	10 54 21.26 ^{0.73}	8 01 35.7 ^{5.9}
16	10 54 22.83 ^{0.84}	8 01 45.1 ^{3.8}	30	10 54 21.99 ^{0.85}	8 01 29.8 ^{6.7}
17	10 54 21.99 ^{-0.72}	8 01 48.9 ^{+3.0}	31	10 54 22.84 ^{+0.97}	8 01 23.1 ^{-7.4}
18	10 54 21.27	+8 01 51.9	June 1	10 54 23.81	+8 01 15.7

The sidereal time of semi-diameter passing the meridian is 0^h08.
For semi-diameter and horizontal parallax, see pages 232-235.

Date	log A	log B	log C	log D	Date	log A	log B	log C	log D
Jan. 1	9.4671	0.6455 n	0.4977 m	1.3049	Feb. 16	9.6473	0.6839 n	1.1943 n	1.0543
2	9.4727	0.6455 n	0.5410 m	1.3036	17	9.6499	0.6849 n	1.1992 n	1.0425
3	9.4782	0.6456 n	0.5801 m	1.3020	18	9.6523	0.6858 n	1.2040 n	1.0303
4	9.4836	0.6457 n	0.6159 m	1.3004	19	9.6548	0.6867 n	1.2086 n	1.0176
5	9.4890	0.6458 n	0.6488 m	1.2985	20	9.6572	0.6876 n	1.2131 n	1.0044
6	9.4942	0.6460 n	0.6793 m	1.2966	21	9.6595	0.6884 n	1.2173 n	0.9907
7	9.4994	0.6462 n	0.7076 m	1.2945	22	9.6618	0.6892 n	1.2214 n	0.9764
8	9.5045	0.6466 n	0.7341 m	1.2922	23	9.6641	0.6899 n	1.2253 n	0.9614
9	9.5095	0.6470 n	0.7589 m	1.2898	24	9.6663	0.6906 n	1.2290 n	0.9458
10	9.5144	0.6474 n	0.7823 m	1.2873	25	9.6685	0.6913 n	1.2326 n	0.9295
11	9.5193	0.6479 n	0.8043 m	1.2846	26	9.6707	0.6920 n	1.2361 n	0.9124
12	9.5240	0.6485 n	0.8251 m	1.2817	27	9.6728	0.6927 n	1.2392 n	0.8944
13	9.5287	0.6491 n	0.8449 m	1.2787	28	9.6749	0.6932 n	1.2423 n	0.8756
14	9.5333	0.6498 n	0.8636 m	1.2755	Mar. 1	9.6770	0.6937 n	1.2452 n	0.8558
15	9.5378	0.6505 n	0.8815 m	1.2722	2	9.6791	0.6942 n	1.2480 n	0.8349
16	9.5423	0.6512 n	0.8985 m	1.2686	3	9.6811	0.6947 n	1.2506 n	0.8129
17	9.5466	0.6519 n	0.9147 m	1.2650	4	9.6831	0.6950 n	1.2531 n	0.7895
18	9.5509	0.6527 n	0.9302 m	1.2611	5	9.6851	0.6953 n	1.2554 n	0.7646
19	9.5551	0.6536 n	0.9451 m	1.2571	6	9.6870	0.6956 n	1.2576 n	0.7382
20	9.5593	0.6546 n	0.9593 m	1.2529	7	9.6889	0.6958 n	1.2596 n	0.7099
21	9.5634	0.6555 n	0.9729 m	1.2486	8	9.6908	0.6960 n	1.2615 n	0.6795
22	9.5674	0.6565 n	0.9860 m	1.2440	9	9.6927	0.6962 n	1.2633 n	0.6466
23	9.5713	0.6575 n	0.9986 m	1.2393	10	9.6945	0.6962 n	1.2649 n	0.6110
24	9.5752	0.6585 n	1.0107 m	1.2344	11	9.6964	0.6962 n	1.2664 n	0.5720
25	9.5790	0.6595 n	1.0223 m	1.2292	12	9.6982	0.6961 n	1.2677 n	0.5291
26	9.5827	0.6606 n	1.0334 m	1.2239	13	9.7000	0.6960 n	1.2689 n	0.4814
27	9.5864	0.6617 n	1.0442 m	1.2184	14	9.7018	0.6959 n	1.2700 n	0.4276
28	9.5900	0.6629 n	1.0546 m	1.2127	15	9.7035	0.6957 n	1.2709 n	0.3661
29	9.5935	0.6640 n	1.0646 m	1.2067	16	9.7053	0.6954 n	1.2717 n	0.2943
30	9.5970	0.6651 n	1.0742 m	1.2006	17	9.7070	0.6950 n	1.2723 n	0.2081
31	9.6004	0.6662 n	1.0835 m	1.1942	18	9.7088	0.6946 n	1.2729 n	0.1003
Feb. 1	9.6037	0.6674 n	1.0924 m	1.1876	19	9.7105	0.6942 n	1.2733 n	9.9567
2	9.6070	0.6685 n	1.1010 m	1.1807	20	9.7122	0.6937 n	1.2735 n	9.7403
3	9.6103	0.6696 n	1.1094 m	1.1736	21	9.7139	0.6931 n	1.2737 n	9.2900
4	9.6134	0.6708 n	1.1174 m	1.1662	22	9.7156	0.6925 n	1.2737 n	9.2039 n
5	9.6165	0.6720 n	1.1251 m	1.1586	23	9.7173	0.6918 n	1.2736 n	9.7114 n
6	9.6196	0.6731 n	1.1326 m	1.1507	24	9.7190	0.6911 n	1.2733 n	9.9389 n
7	9.6226	0.6742 n	1.1398 m	1.1426	25	9.7207	0.6903 n	1.2729 n	0.0873 n
8	9.6256	0.6754 n	1.1468 m	1.1341	26	9.7223	0.6894 n	1.2724 n	0.1975 n
9	9.6285	0.6765 n	1.1535 m	1.1253	27	9.7240	0.6885 n	1.2718 n	0.2851 n
10	9.6313	0.6776 n	1.1600 m	1.1162	28	9.7257	0.6875 n	1.2710 n	0.3579 n
11	9.6341	0.6787 n	1.1662 m	1.1068	29	9.7273	0.6865 n	1.2701 n	0.4201 n
12	9.6368	0.6798 n	1.1723 m	1.0971	30	9.7290	0.6854 n	1.2690 n	0.4743 n
13	9.6395	0.6809 n	1.1781 m	1.0869	31	9.7307	0.6842 n	1.2679 n	0.5223 n
14	9.6422	0.6820 n	1.1837 m	1.0765	Apr. 1	9.7324	0.6830 n	1.2666 n	0.5654 n
15	9.6448	0.6830 n	1.1891 m	1.0656	2	9.7340	0.6817 n	1.2651 n	0.6045 n
16	9.6473	0.6839 n	1.1943 m	1.0543	3	9.7357	0.6803 n	1.2636 n	0.6402 n

Date	log A	log B	log C	log D	Date	log A	log B	log C	log D
Apr. 1	9.7324	0.6830n	I.2666n	0.5654n	May 17	9.8176	0.5771n	I.0304n	I.2254n
2	9.7340	0.6817n	I.2651n	0.6045n	18	9.8196	0.5743n	I.0197n	I.2304n
3	9.7357	0.6803n	I.2636n	0.6402n	19	9.8217	0.5715n	I.0086n	I.2352n
4	9.7374	0.6789n	I.2619n	0.6731n	20	9.8238	0.5687n	0.9971n	I.2399n
5	9.7390	0.6774n	I.2600n	0.7035n	21	9.8259	0.5658n	0.9852n	I.2443n
6	9.7407	0.6759n	I.2581n	0.7318n	22	9.8280	0.5630n	0.9728n	I.2486n
7	9.7424	0.6744n	I.2560n	0.7582n	23	9.8301	0.5603n	0.9599n	I.2527n
8	9.7441	0.6727n	I.2537n	0.7830n	24	9.8322	0.5576n	0.9465n	I.2567n
9	9.7458	0.6711n	I.2514n	0.8063n	25	9.8343	0.5550n	0.9326n	I.2605n
10	9.7475	0.6693n	I.2488n	0.8282n	26	9.8364	0.5523n	0.9181n	I.2642n
11	9.7493	0.6675n	I.2462n	0.8490n	27	9.8385	0.5496n	0.9029n	I.2677n
12	9.7510	0.6657n	I.2434n	0.8687n	28	9.8407	0.5469n	0.8871n	I.2710n
13	9.7527	0.6638n	I.2404n	0.8875n	29	9.8428	0.5442n	0.8706n	I.2742n
14	9.7544	0.6618n	I.2373n	0.9053n	30	9.8449	0.5416n	0.8533n	I.2773n
15	9.7562	0.6598n	I.2341n	0.9223n	31	9.8470	0.5391n	0.8352n	I.2802n
16	9.7579	0.6578n	I.2307n	0.9385n	June 1	9.8492	0.5366n	0.8162n	I.2830n
17	9.7597	0.6557n	I.2271n	0.9540n	2	9.8513	0.5340n	0.7961n	I.2856n
18	9.7615	0.6536n	I.2234n	0.9688n	3	9.8534	0.5316n	0.7750n	I.2881n
19	9.7633	0.6515n	I.2195n	0.9830n	4	9.8555	0.5292n	0.7527n	I.2905n
20	9.7651	0.6492n	I.2155n	0.9966n	5	9.8577	0.5269n	0.7290n	I.2927n
21	9.7669	0.6469n	I.2113n	I.0097n	6	9.8598	0.5247n	0.7039n	I.2948n
22	9.7687	0.6445n	I.2070n	I.0223n	7	9.8619	0.5226n	0.6771n	I.2967n
23	9.7705	0.6422n	I.2025n	I.0344n	8	9.8640	0.5205n	0.6484n	I.2986n
24	9.7724	0.6398n	I.1978n	I.0461n	9	9.8661	0.5184n	0.6176n	I.3003n
25	9.7742	0.6373n	I.1929n	I.0573n	10	9.8683	0.5164n	0.5843n	I.3019n
26	9.7761	0.6348n	I.1879n	I.0681n	11	9.8704	0.5143n	0.5480n	I.3033n
27	9.7779	0.6323n	I.1826n	I.0785n	12	9.8725	0.5124n	0.5084n	I.3046n
28	9.7798	0.6297n	I.1772n	I.0885n	13	9.8746	0.5105n	0.4648n	I.3058n
29	9.7817	0.6272n	I.1716n	I.0982n	14	9.8766	0.5088n	0.4158n	I.3069n
30	9.7836	0.6245n	I.1658n	I.1075n	15	9.8787	0.5072n	0.3607n	I.3079n
May 1	9.7855	0.6218n	I.1598n	I.1165n	16	9.8808	0.5056n	0.2975n	I.3087n
2	9.7875	0.6193n	I.1536n	I.1252n	17	9.8829	0.5041n	0.2233n	I.3094n
3	9.7894	0.6166n	I.1472n	I.1336n	18	9.8849	0.5027n	0.1336n	I.3100n
4	9.7913	0.6139n	I.1405n	I.1418n	19	9.8870	0.5013n	0.0203n	I.3105n
5	9.7933	0.6111n	I.1336n	I.1496n	20	9.8890	0.5000n	9.8665n	I.3108n
6	9.7953	0.6083n	I.1265n	I.1572n	21	9.8910	0.4989n	9.6259n	I.3110n
7	9.7973	0.6055n	I.1192n	I.1645n	22	9.8931	0.4978n	9.0402n	I.3111n
8	9.7992	0.6027n	I.1116n	I.1716n	23	9.8951	0.4967n	9.3073	I.3111n
9	9.8012	0.5999n	I.1037n	I.1784n	24	9.8972	0.4957n	9.7122	I.3110n
10	9.8033	0.5970n	I.0956n	I.1851n	25	9.8992	0.4947n	9.9180	I.3107n
11	9.8053	0.5943n	I.0872n	I.1914n	26	9.9012	0.4939n	0.0569	I.3103n
12	9.8073	0.5915n	I.0785n	I.1976n	27	9.9031	0.4931n	0.1619	I.3098n
13	9.8093	0.5886n	I.0696n	I.2036n	28	9.9051	0.4925n	0.2463	I.3092n
14	9.8114	0.5857n	I.0603n	I.2093n	29	9.9070	0.4918n	0.3168	I.3085n
15	9.8134	0.5829n	I.0506n	I.2149n	30	9.9089	0.4912n	0.3773	I.3076n
16	9.8155	0.5800n	I.0407n	I.2203n	July 1	9.9109	0.4907n	0.4304	I.3066n
17	9.8176	0.5771n	I.0304n	I.2254n	2	9.9128	0.4904n	0.4775	I.3055n

Date	log A	log B	log C	log D	Date	log A	log B	log C	log D
July 1	9·9109	0·4907 n	0·4304	I·3066 n	Aug. 16	9·9830	0·5294 n	I·1715	I·0984 n
2	9·9128	0·4904 n	0·4775	I·3055 n	17	9·9841	0·5307 n	I·1770	I·0889 n
3	9·9147	0·4901 n	0·5199	I·3043 n	18	9·9853	0·5320 n	I·1824	I·0790 n
4	9·9166	0·4900 n	0·5584	I·3029 n	19	9·9864	0·5331 n	I·1876	I·0687 n
5	9·9185	0·4898 n	0·5937	I·3014 n	20	9·9876	0·5343 n	I·1926	I·0581 n
6	9·9204	0·4898 n	0·6262	I·2998 n	21	9·9887	0·5354 n	I·1974	I·0470 n
7	9·9222	0·4898 n	0·6563	I·2981 n	22	9·9898	0·5365 n	I·2020	I·0356 n
8	9·9241	0·4898 n	0·6844	I·2962 n	23	9·9909	0·5376 n	I·2065	I·0237 n
9	9·9259	0·4898 n	0·7106	I·2942 n	24	9·9919	0·5386 n	I·2108	I·0113 n
10	9·9277	0·4902 n	0·7353	I·2921 n	25	9·9930	0·5396 n	I·2150	0·9984 n
11	9·9295	0·4905 n	0·7585	I·2899 n	26	9·9941	0·5405 n	I·2190	0·9850 n
12	9·9313	0·4909 n	0·7804	I·2875 n	27	9·9951	0·5414 n	I·2228	0·9711 n
13	9·9330	0·4914 n	0·8011	I·2850 n	28	9·9961	0·5423 n	I·2265	0·9566 n
14	9·9347	0·4919 n	0·8208	I·2823 n	29	9·9971	0·5432 n	I·2300	0·9414 n
15	9·9365	0·4925 n	0·8396	I·2795 n	30	9·9981	0·5439 n	I·2334	0·9255 n
16	9·9382	0·4931 n	0·8574	I·2766 n	31	9·9991	0·5447 n	I·2366	0·9089 n
17	9·9399	0·4937 n	0·8744	I·2735 n	Sept. 1	0·0001	0·5453 n	I·2397	0·8915 n
18	9·9416	0·4944 n	0·8907	I·2703 n	2	0·0011	0·5459 n	I·2427	0·8732 n
19	9·9433	0·4953 n	0·9062	I·2669 n	3	0·0021	0·5464 n	I·2455	0·8540 n
20	9·9449	0·4961 n	0·9212	I·2634 n	4	0·0030	0·5469 n	I·2481	0·8338 n
21	9·9465	0·4969 n	0·9355	I·2598 n	5	0·0039	0·5474 n	I·2507	0·8124 n
22	9·9481	0·4980 n	0·9492	I·2559 n	6	0·0048	0·5478 n	I·2531	0·7898 n
23	9·9497	0·4991 n	0·9624	I·2520 n	7	0·0057	0·5480 n	I·2553	0·7658 n
24	9·9513	0·5001 n	0·9751	I·2478 n	8	0·0066	0·5483 n	I·2574	0·7403 n
25	9·9529	0·5012 n	0·9873	I·2436 n	9	0·0075	0·5485 n	I·2594	0·7130 n
26	9·9544	0·5023 n	0·9990	I·2391 n	10	0·0084	0·5488 n	I·2613	0·6837 n
27	9·9560	0·5034 n	I·0104	I·2345 n	11	0·0093	0·5488 n	I·2630	0·6521 n
28	9·9575	0·5046 n	I·0213	I·2297 n	12	0·0102	0·5488 n	I·2646	0·6180 n
29	9·9590	0·5058 n	I·0319	I·2247 n	13	0·0110	0·5488 n	I·2660	0·5807 n
30	9·9604	0·5071 n	I·0420	I·2195 n	14	0·0119	0·5485 n	I·2674	0·5398 n
31	9·9619	0·5083 n	I·0519	I·2142 n	15	0·0128	0·5483 n	I·2686	0·4945 n
Aug. 1	9·9634	0·5095 n	I·0614	I·2087 n	16	0·0136	0·5480 n	I·2697	0·4436 n
2	9·9648	0·5108 n	I·0705	I·2029 n	17	0·0144	0·5478 n	I·2706	0·3859 n
3	9·9662	0·5122 n	I·0794	I·1970 n	18	0·0153	0·5473 n	I·2714	0·3192 n
4	9·9676	0·5135 n	I·0880	I·1909 n	19	0·0161	0·5468 n	I·2721	0·2401 n
5	9·9689	0·5148 n	I·0963	I·1845 n	20	0·0170	0·5462 n	I·2727	0·1430 n
6	9·9703	0·5161 n	I·1043	I·1780 n	21	0·0178	0·5455 n	I·2731	0·0176 n
7	9·9716	0·5175 n	I·1121	I·1712 n	22	0·0186	0·5447 n	I·2734	9·8402 n
8	9·9730	0·5188 n	I·1196	I·1642 n	23	0·0194	0·5438 n	I·2736	9·5350 n
9	9·9743	0·5201 n	I·1268	I·1569 n	24	0·0202	0·5428 n	I·2737	7·8401
10	9·9756	0·5215 n	I·1339	I·1494 n	25	0·0211	0·5418 n	I·2736	9·5524
11	9·9768	0·5228 n	I·1407	I·1416 n	26	0·0219	0·5408 n	I·2734	9·8493
12	9·9781	0·5241 n	I·1472	I·1335 n	27	0·0227	0·5397 n	I·2731	0·0240
13	9·9793	0·5254 n	I·1536	I·1252 n	28	0·0235	0·5385 n	I·2727	0·1481
14	9·9805	0·5267 n	I·1598	I·1166 n	29	0·0243	0·5372 n	I·2721	0·2446
15	9·9818	0·5281 n	I·1657	I·1077 n	30	0·0252	0·5357 n	I·2714	0·3233
16	9·9830	0·5294 n	I·1715	I·0984 n	Oct. 1	0·0260	0·5341 n	I·2706	0·3899

Date	log A	log B	log C	log D	Date	log A	log B	log C	log D
Oct. 1	0.0260	0.5341 ^m	1.2706	0.3899	Nov. 16	0.0697	0.3744 ^m	1.0562	1.2117
2	0.0268	0.5326 ^m	1.2696	0.4476	17	0.0708	0.3694 ^m	1.0459	1.2175
3	0.0276	0.5308 ^m	1.2685	0.4984	18	0.0720	0.3645 ^m	1.0353	1.2230
4	0.0284	0.5290 ^m	1.2673	0.5438	19	0.0731	0.3596 ^m	1.0243	1.2283
5	0.0292	0.5272 ^m	1.2659	0.5847	20	0.0743	0.3547 ^m	1.0129	1.2334
6	0.0301	0.5252 ^m	1.2644	0.6221	21	0.0755	0.3497 ^m	1.0010	1.2383
7	0.0309	0.5231 ^m	1.2628	0.6564	22	0.0767	0.3446 ^m	0.9886	1.2431
8	0.0317	0.5210 ^m	1.2610	0.6881	23	0.0779	0.3395 ^m	0.9757	1.2476
9	0.0326	0.5189 ^m	1.2591	0.7175	24	0.0791	0.3343 ^m	0.9623	1.2520
10	0.0334	0.5165 ^m	1.2571	0.7450	25	0.0803	0.3292 ^m	0.9483	1.2562
11	0.0343	0.5141 ^m	1.2549	0.7707	26	0.0815	0.3243 ^m	0.9337	1.2602
12	0.0351	0.5117 ^m	1.2525	0.7949	27	0.0827	0.3193 ^m	0.9185	1.2641
13	0.0360	0.5091 ^m	1.2501	0.8177	28	0.0839	0.3143 ^m	0.9025	1.2678
14	0.0368	0.5064 ^m	1.2475	0.8392	29	0.0852	0.3094 ^m	0.8858	1.2713
15	0.0377	0.5037 ^m	1.2447	0.8596	30	0.0864	0.3047 ^m	0.8683	1.2747
16	0.0386	0.5009 ^m	1.2418	0.8790	Dec. 1	0.0876	0.2999 ^m	0.8499	1.2779
17	0.0394	0.4980 ^m	1.2387	0.8974	2	0.0889	0.2951 ^m	0.8305	1.2809
18	0.0403	0.4950 ^m	1.2355	0.9150	3	0.0901	0.2903 ^m	0.8101	1.2838
19	0.0412	0.4919 ^m	1.2321	0.9318	4	0.0914	0.2856 ^m	0.7885	1.2865
20	0.0421	0.4887 ^m	1.2286	0.9478	5	0.0926	0.2810 ^m	0.7656	1.2891
21	0.0430	0.4854 ^m	1.2249	0.9631	6	0.0939	0.2765 ^m	0.7413	1.2915
22	0.0439	0.4820 ^m	1.2210	0.9778	7	0.0952	0.2721 ^m	0.7154	1.2938
23	0.0449	0.4786 ^m	1.2170	0.9919	8	0.0964	0.2676 ^m	0.6877	1.2960
24	0.0458	0.4751 ^m	1.2127	1.0055	9	0.0977	0.2634 ^m	0.6580	1.2980
25	0.0467	0.4714 ^m	1.2084	1.0185	10	0.0990	0.2594 ^m	0.6259	1.2998
26	0.0477	0.4676 ^m	1.2038	1.0310	11	0.1002	0.2553 ^m	0.5911	1.3015
27	0.0486	0.4639 ^m	1.1990	1.0430	12	0.1015	0.2514 ^m	0.5532	1.3031
28	0.0496	0.4601 ^m	1.1941	1.0546	13	0.1028	0.2477 ^m	0.5114	1.3045
29	0.0506	0.4562 ^m	1.1890	1.0658	14	0.1041	0.2440 ^m	0.4650	1.3058
30	0.0516	0.4522 ^m	1.1836	1.0765	15	0.1053	0.2405 ^m	0.4129	1.3070
31	0.0525	0.4481 ^m	1.1781	1.0869	16	0.1066	0.2370 ^m	0.3535	1.3080
Nov. 1	0.0535	0.4439 ^m	1.1724	1.0969	17	0.1079	0.2340 ^m	0.2845	1.3088
2	0.0546	0.4396 ^m	1.1664	1.1066	18	0.1091	0.2310 ^m	0.2022	1.3095
3	0.0556	0.4354 ^m	1.1602	1.1159	19	0.1104	0.2281 ^m	0.1005	1.3101
4	0.0566	0.4310 ^m	1.1538	1.1249	20	0.1117	0.2251 ^m	9.9672	1.3106
5	0.0576	0.4267 ^m	1.1472	1.1336	21	0.1129	0.2225 ^m	9.7736	1.3109
6	0.0587	0.4223 ^m	1.1403	1.1420	22	0.1142	0.2201 ^m	9.4150	1.3111
7	0.0598	0.4178 ^m	1.1332	1.1501	23	0.1155	0.2177 ^m	8.8676 ^m	1.3111
8	0.0608	0.4131 ^m	1.1258	1.1579	24	0.1167	0.2156 ^m	9.6101 ^m	1.3110
9	0.0619	0.4084 ^m	1.1182	1.1655	25	0.1180	0.2138 ^m	9.8700 ^m	1.3108
10	0.0630	0.4038 ^m	1.1102	1.1728	26	0.1192	0.2122 ^m	0.0313 ^m	1.3104
11	0.0641	0.3990 ^m	1.1020	1.1799	27	0.1204	0.2106 ^m	0.1486 ^m	1.3099
12	0.0652	0.3941 ^m	1.0935	1.1867	28	0.1217	0.2092 ^m	0.2407 ^m	1.3092
13	0.0663	0.3893 ^m	1.0847	1.1933	29	0.1229	0.2082 ^m	0.3165 ^m	1.3084
14	0.0674	0.3844 ^m	1.0755	1.1997	30	0.1241	0.2071 ^m	0.3810 ^m	1.3075
15	0.0685	0.3793 ^m	1.0660	1.2058	31	0.1253	0.2060 ^m	0.4370 ^m	1.3065
16	0.0697	0.3744 ^m	1.0562	1.2117	32	0.1266	0.2055 ^m	0.4865 ^m	1.3053

Date	A	B	C	D	A'	B'
Jan. 1	+0.2931	-4.42	-3.15	+20.18	-0.0059	+0.02
2	.2970	4.42	3.48	20.12	- .0050	+ .06
3	.3008	4.42	3.80	20.05	- .0032	+ .09
4	.3045	4.42	4.13	19.97	- .0009	+ .10
5	.3083	4.42	4.45	19.89	+ .0016	+ .09
6	+0.3121	-4.43	-4.78	+19.80	+0.0037	+0.06
7	.3158	4.43	5.10	19.70	+ .0048	+ .01
8	.3195	4.43	5.42	19.60	+ .0048	- .05
9	.3232	4.44	5.74	19.49	+ .0037	- .09
10	.3269	4.44	6.06	19.38	+ .0018	- .11
11	+0.3306	-4.44	-6.37	+19.26	-0.0002	-0.10
12	.3342	4.45	6.69	19.13	- .0020	- .07
13	.3378	4.46	7.00	19.00	- .0030	- .03
14	.3414	4.46	7.31	18.86	- .0031	+ .02
15	.3450	4.47	7.61	18.71	- .0022	+ .06
16	+0.3485	-4.48	-7.92	+18.56	-0.0007	+0.09
17	.3521	4.49	8.22	18.41	+ .0011	+ .10
18	.3556	4.49	8.52	18.24	+ .0027	+ .09
19	.3590	4.50	8.81	18.08	+ .0039	+ .06
20	.3625	4.51	9.11	17.90	+ .0044	+ .02
21	+0.3659	-4.52	-9.40	+17.72	+0.0042	-0.02
22	.3693	4.53	9.68	17.54	+ .0033	- .05
23	.3727	4.54	9.97	17.35	+ .0017	- .08
24	.3760	4.55	10.25	17.15	- .0002	- .09
25	.3793	4.57	10.53	16.95	- .0023	- .09
26	+0.3826	-4.58	-10.80	+16.75	-0.0041	-0.07
27	.3858	4.59	11.07	16.53	- .0055	- .04
28	.3890	4.60	11.34	16.32	- .0060	+ .01
29	.3922	4.61	11.60	16.10	- .0056	+ .05
30	.3954	4.62	11.86	15.87	- .0042	+ .08
31	+0.3985	-4.64	-12.12	+15.64	-0.0020	+0.10
Feb. 1	.4016	4.65	12.37	15.40	+ .0004	+ .09
2	.4046	4.66	12.62	15.16	+ .0026	+ .07
3	.4076	4.67	12.86	14.91	+ .0041	+ .02
4	.4106	4.69	13.10	14.66	+ .0046	- .03
5	+0.4136	-4.70	-13.34	+14.41	+0.0039	-0.07
6	.4165	4.71	13.57	14.15	+ .0023	- .10
7	.4194	4.72	13.80	13.89	+ .0003	- .10
8	.4223	4.74	14.02	13.62	- .0015	- .08
9	.4251	4.75	14.24	13.35	- .0027	- .04
10	+0.4279	-4.76	-14.45	+13.07	-0.0030	+0.01
11	.4306	4.77	14.66	12.79	- .0024	+ .05
12	.4334	4.78	14.87	12.51	- .0010	+ .08
13	.4361	4.80	15.07	12.22	+ .0008	+ .10
14	.4387	4.81	15.26	11.93	+ .0025	+ .09
15	+0.4414	-4.82	-15.45	+11.63	+0.0038	+0.07
16	+0.4440	-4.83	-15.64	+11.33	+0.0045	+0.03

$$E = + 0^{\text{m}}.002$$

Date	A	B	C	D	A'	B'
Feb. 16	+0.4440	-4.83	-15.64	+11.33	+0.0045	+0.03
17	.4465	4.84	15.82	11.03	+ .0045	.00
18	.4491	4.85	16.00	10.72	+ .0038	-.04
19	.4516	4.86	16.17	10.41	+ .0025	-.07
20	.4541	4.87	16.33	10.10	+ .0005	-.09
21	+0.4566	-4.88	-16.49	+ 9.79	-0.0014	-0.09
22	.4590	4.89	16.65	9.47	- .0034	-.08
23	.4614	4.90	16.80	9.15	- .0049	-.05
24	.4638	4.90	16.94	8.83	- .0058	-.01
25	.4662	4.91	17.08	8.50	- .0057	+ .04
26	+0.4685	-4.92	-17.22	+ 8.17	-0.0048	+0.07
27	.4708	4.93	17.35	7.84	- .0029	+ .10
28	.4731	4.93	17.47	7.51	- .0006	+ .10
Mar. 1	.4754	4.94	17.59	7.17	+ .0017	+ .08
2	.4776	4.94	17.70	6.84	+ .0034	+ .04
3	+0.4798	-4.95	-17.81	+ 6.50	+0.0041	-0.01
4	.4820	4.95	17.91	6.16	+ .0038	-.06
5	.4842	4.96	18.01	5.82	+ .0025	-.09
6	.4864	4.96	18.10	5.47	+ .0007	-.10
7	.4885	4.96	18.18	5.13	- .0012	-.09
8	+0.4907	-4.97	-18.26	+ 4.78	-0.0026	-0.06
9	.4928	4.97	18.33	4.43	- .0032	-.01
10	.4949	4.97	18.40	4.08	- .0027	+ .04
11	.4970	4.97	18.46	3.73	- .0015	+ .08
12	.4991	4.97	18.52	3.38	+ .0003	+ .10
13	+0.5012	-4.97	-18.57	+ 3.03	+0.0021	+0.10
14	.5032	4.96	18.62	2.68	+ .0036	+ .08
15	.5053	4.96	18.66	2.32	+ .0046	+ .05
16	.5073	4.96	18.69	1.97	+ .0048	+ .01
17	.5094	4.95	18.72	1.61	+ .0043	-.03
18	+0.5114	-4.95	-18.74	+ 1.26	+0.0031	-0.06
19	.5135	4.94	18.76	0.91	+ .0014	-.08
20	.5155	4.94	18.77	0.55	- .0005	-.09
21	.5175	4.93	18.78	+ 0.20	- .0025	-.08
22	.5195	4.93	18.78	- 0.16	- .0042	-.06
23	+0.5216	-4.92	-18.77	- 0.51	-0.0053	-0.02
24	.5236	4.91	18.76	0.87	- .0056	+ .02
25	.5256	4.90	18.75	1.22	- .0049	+ .06
26	.5276	4.89	18.72	1.58	- .0033	+ .09
27	.5297	4.88	18.70	1.93	- .0013	+ .10
28	+0.5317	-4.87	-18.66	- 2.28	+0.0010	+0.09
29	.5338	4.86	18.62	2.63	+ .0028	+ .05
30	.5358	4.85	18.58	2.98	+ .0038	.00
31	.5379	4.83	18.53	3.33	+ .0038	-.05
Apr. 1	.5400	4.82	18.47	3.68	+ .0026	-.08
2	+0.5420	-4.80	-18.41	- 4.02	+0.0009	-0.10
3	+0.5441	-4.79	-18.35	- 4.37	-0.0010	-0.10

$$E = + 0^{\text{h}}.002$$

BESSELIAN DAY NUMBERS, 1935

Date	A	B	C	D	A'	B'
Apr. 1	+0.5400	-4.82	-18.47	- 3.68	+0.0026	-0.08
2	.5420	4.80	18.41	4.02	+ .0009	- .10
3	.5441	4.79	18.35	4.37	- .0010	- .10
4	.5462	4.77	18.28	4.71	- .0026	- .07
5	.5483	4.76	18.20	5.05	- .0034	- .02
6	+0.5505	-4.74	-18.12	- 5.39	-0.0032	+0.02
7	.5526	4.72	18.03	5.73	- .0021	+ .07
8	.5548	4.71	17.94	6.07	- .0004	+ .09
9	.5570	4.69	17.84	6.40	+ .0015	+ .10
10	.5592	4.67	17.74	6.73	+ .0032	+ .09
11	+0.5614	-4.65	-17.63	- 7.06	+0.0044	+0.06
12	.5636	4.63	17.51	7.39	+ .0049	+ .02
13	.5659	4.61	17.39	7.72	+ .0046	- .02
14	.5681	4.59	17.27	8.04	+ .0036	- .05
15	.5704	4.57	17.14	8.36	+ .0020	- .08
16	+0.5727	-4.55	-17.01	- 8.68	+0.0001	-0.09
17	.5751	4.53	16.87	8.99	- .0018	- .09
18	.5774	4.50	16.73	9.31	- .0036	- .07
19	.5798	4.48	16.58	9.62	- .0048	- .03
20	.5822	4.46	16.43	9.92	- .0053	+ .01
21	+0.5846	-4.43	-16.27	-10.23	-0.0049	+0.05
22	.5871	4.41	16.11	10.53	- .0036	+ .08
23	.5896	4.39	15.94	10.83	- .0017	+ .10
24	.5921	4.36	15.77	11.12	+ .0005	+ .09
25	.5946	4.34	15.59	11.41	+ .0025	+ .07
26	+0.5971	-4.31	-15.41	-11.70	+0.0037	+0.02
27	.5997	4.29	15.23	11.98	+ .0039	- .03
28	.6023	4.26	15.04	12.26	+ .0031	- .07
29	.6049	4.24	14.85	12.54	+ .0014	- .10
30	.6076	4.21	14.65	12.81	- .0005	- .10
May 1	+0.6103	-4.19	-14.45	-13.08	-0.0024	-0.08
2	.6130	4.16	14.24	13.34	- .0035	- .04
3	.6157	4.14	14.03	13.60	- .0037	+ .01
4	.6185	4.11	13.82	13.86	- .0029	+ .05
5	.6213	4.08	13.60	14.11	- .0013	+ .08
6	+0.6241	-4.06	-13.38	-14.36	+0.0007	+0.10
7	.6270	4.03	13.16	14.61	+ .0026	+ .09
8	.6299	4.01	12.93	14.85	+ .0040	+ .07
9	.6328	3.98	12.70	15.08	+ .0048	+ .03
10	.6357	3.95	12.46	15.31	+ .0047	- .01
11	+0.6387	-3.93	-12.22	-15.54	+0.0039	-0.05
12	.6417	3.90	11.98	15.76	+ .0025	- .07
13	.6447	3.88	11.74	15.98	+ .0007	- .09
14	.6477	3.85	11.49	16.19	- .0013	- .09
15	.6508	3.83	11.24	16.40	- .0031	- .07
16	+0.6539	-3.80	-10.98	-16.60	-0.0045	-0.04
17	+0.6570	-3.78	-10.72	-16.80	-0.0052	-0.01

$E = + 0.002$

Date	A	B	C	D	A'	B'
May 17	+0.6570	-3.78	-10.72	-16.80	-0.0052	-0.01
18	.6601	3.75	10.46	17.00	- .0051	+ .04
19	.6633	3.73	10.20	17.19	- .0040	+ .07
20	.6665	3.70	9.93	17.37	- .0025	+ .09
21	.6697	3.68	9.66	17.55	.0000	+ .10
22	+0.6730	-3.66	- 9.39	-17.73	+0.0021	+0.08
23	.6762	3.63	9.12	17.90	+ .0037	+ .04
24	.6795	3.61	8.84	18.06	+ .0043	- .01
25	.6828	3.59	8.56	18.22	+ .0038	- .06
26	.6862	3.57	8.28	18.37	+ .0023	- .09
27	+0.6895	-3.54	- 8.00	-18.52	+0.0002	-0.10
28	.6929	3.52	7.71	18.66	- .0018	- .09
29	.6963	3.50	7.42	18.80	- .0033	- .06
30	.6997	3.48	7.13	18.94	- .0038	- .01
31	.7031	3.46	6.84	19.06	- .0034	+ .04
June 1	+0.7066	-3.44	- 6.55	-19.18	-0.0021	+0.08
2	.7101	3.42	6.25	19.30	- .0001	+ .10
3	.7135	3.40	5.96	19.41	+ .0017	+ .09
4	.7170	3.38	5.66	19.52	+ .0035	+ .07
5	.7206	3.36	5.36	19.62	+ .0046	+ .04
6	+0.7241	-3.35	- 5.06	-19.71	+0.0048	0.00
7	.7276	3.33	4.75	19.80	+ .0042	- .04
8	.7312	3.31	4.45	19.89	+ .0029	- .07
9	.7348	3.30	4.15	19.97	+ .0012	- .09
10	.7383	3.28	3.84	20.04	- .0008	- .09
11	+0.7419	-3.27	- 3.53	-20.11	-0.0027	-0.08
12	.7455	3.25	3.22	20.17	- .0042	- .05
13	.7491	3.24	2.91	20.22	- .0052	- .02
14	.7527	3.23	2.61	20.27	- .0053	+ .02
15	.7564	3.21	2.29	20.32	- .0045	+ .06
16	+0.7600	-3.20	- 1.98	-20.36	-0.0030	+0.09
17	.7637	3.19	1.67	20.39	- .0008	+ .10
18	.7673	3.18	1.36	20.42	+ .0015	+ .08
19	.7709	3.17	1.05	20.44	+ .0033	+ .05
20	.7745	3.16	0.74	20.46	+ .0043	+ .01
21	+0.7782	-3.15	- 0.42	-20.47	+0.0042	-0.04
22	.7818	3.15	- 0.11	20.47	+ .0031	- .08
23	.7855	3.14	+ 0.20	20.47	+ .0013	- .10
24	.7891	3.13	0.52	20.46	- .0008	- .10
25	.7928	3.12	0.83	20.45	- .0026	- .07
26	+0.7964	-3.12	+ 1.14	-20.43	-0.0035	-0.02
27	.8001	3.11	1.45	20.41	- .0035	+ .03
28	.8037	3.11	1.76	20.38	- .0024	+ .07
29	.8073	3.10	2.07	20.34	- .0007	+ .09
30	.8109	3.10	2.38	20.30	+ .0013	+ .10
July 1	+0.8145	-3.09	+ 2.69	-20.26	+0.0031	+0.08
2	+0.8181	-3.09	+ 3.00	-20.21	+0.0043	+0.05

$$E = + 0^s.002$$

BESSELIAN DAY NUMBERS, 1935

Date	A	B	C	D	A'	B'
July 1	+0.8145	-3.09	+ 2.69	-20.26	+0.0031	+0.08
2	.8181	3.09	3.00	20.21	+ .0043	+ .05
3	.8217	3.09	3.31	20.15	+ .0047	+ .02
4	.8253	3.09	3.62	20.09	+ .0044	- .02
5	.8289	3.09	3.92	20.02	+ .0033	- .06
6	+0.8325	-3.09	+ 4.23	-19.95	+0.0017	-0.08
7	.8360	3.09	4.53	19.87	- .0002	- .09
8	.8396	3.09	4.83	19.78	- .0022	- .08
9	.8431	3.09	5.14	19.69	- .0039	- .06
10	.8466	3.09	5.44	19.59	- .0051	- .03
11	+0.8501	-3.09	+ 5.73	-19.49	-0.0056	+0.01
12	.8536	3.10	6.03	19.39	- .0051	+ .05
13	.8571	3.10	6.33	19.27	- .0038	+ .08
14	.8605	3.10	6.62	19.16	- .0018	+ .10
15	.8640	3.11	6.91	19.03	+ .0005	+ .09
16	+0.8674	-3.11	+ 7.20	-18.90	+0.0026	+0.06
17	.8708	3.12	7.49	18.77	+ .0040	+ .02
18	.8742	3.12	7.77	18.63	+ .0043	- .03
19	.8775	3.13	8.06	18.49	+ .0036	- .07
20	.8808	3.13	8.34	18.34	+ .0021	- .10
21	+0.8842	-3.14	+ 8.62	-18.19	+0.0001	-0.10
22	.8875	3.15	8.90	18.03	- .0018	- .08
23	.8907	3.16	9.17	17.86	- .0030	- .04
24	.8940	3.16	9.44	17.69	- .0033	+ .01
25	.8972	3.17	9.71	17.52	- .0026	+ .05
26	+0.9004	-3.18	+ 9.98	-17.34	-0.0011	+0.09
27	.9036	3.19	10.24	17.16	+ .0008	+ .10
28	.9067	3.20	10.50	16.97	+ .0027	+ .09
29	.9098	3.20	10.76	16.78	+ .0041	+ .06
30	.9129	3.21	11.02	16.58	+ .0048	+ .03
31	+0.9160	-3.22	+11.27	-16.38	+0.0047	-0.01
Aug. 1	.9191	3.23	11.52	16.17	+ .0038	- .05
2	.9221	3.24	11.76	15.96	+ .0023	- .07
3	.9251	3.25	12.01	15.74	+ .0005	- .09
4	.9280	3.26	12.25	15.52	- .0015	- .09
5	+0.9310	-3.27	+12.48	-15.29	-0.0034	-0.07
6	.9339	3.28	12.71	15.06	- .0048	- .04
7	.9368	3.29	12.94	14.83	- .0056	.00
8	.9396	3.30	13.17	14.59	- .0055	+ .04
9	.9424	3.31	13.39	14.35	- .0045	+ .07
10	+0.9453	-3.32	+13.61	-14.11	-0.0028	+0.09
11	.9480	3.33	13.83	13.85	- .0006	+ .10
12	.9508	3.34	14.04	13.60	+ .0015	+ .07
13	.9535	3.35	14.24	13.34	+ .0032	+ .04
14	.9562	3.36	14.45	13.08	+ .0039	- .01
15	+0.9589	-3.37	+14.65	-12.81	+0.0037	-0.06
16	+0.9615	-3.38	+14.84	-12.54	+0.0024	-0.09

$$E = + 0^{\circ}.003$$

BESSELIAN DAY NUMBERS, 1935

271

Date	A	B	C	D	A'	B'
Aug. 16	+0.9615	-3.38	+14.84	-12.54	+0.0024	-0.09
17	.9641	3.39	15.03	12.27	+ .0006	- .10
18	.9667	3.40	15.22	11.99	- .0013	- .09
19	.9692	3.41	15.40	11.71	- .0027	- .05
20	.9718	3.42	15.58	11.43	- .0032	- .01
21	+0.9743	-3.43	+15.75	-11.14	-0.0027	+0.04
22	.9768	3.44	15.92	10.85	- .0014	+ .08
23	.9792	3.45	16.09	10.56	+ .0006	+ .10
24	.9816	3.46	16.25	10.26	+ .0024	+ .10
25	.9840	3.46	16.41	9.96	+ .0040	+ .08
26	+0.9864	-3.47	+16.56	- 9.66	+0.0049	+0.04
27	.9888	3.48	16.70	9.36	+ .0051	.00
28	.9911	3.49	16.85	9.05	+ .0044	- .04
29	.9934	3.49	16.98	8.74	+ .0030	- .07
30	.9957	3.50	17.12	8.42	+ .0012	- .09
31	+0.9980	-3.50	+17.24	- 8.11	-0.0007	-0.09
Sept. 1	1.0002	3.51	17.37	7.79	- .0027	- .08
2	.0024	3.51	17.49	7.47	- .0042	- .05
3	.0046	3.52	17.60	7.15	- .0053	- .01
4	.0068	3.52	17.71	6.82	- .0055	+ .03
5	+1.0090	-3.53	+17.81	- 6.49	-0.0049	+0.06
6	.0111	3.53	17.91	6.16	- .0035	+ .09
7	.0133	3.53	18.00	5.83	- .0015	+ .10
8	.0154	3.53	18.09	5.50	+ .0007	+ .08
9	.0175	3.54	18.17	5.16	+ .0024	+ .05
10	+1.0196	-3.54	+18.25	- 4.83	+0.0034	+0.01
11	.0217	3.54	18.32	4.49	+ .0034	- .04
12	.0237	3.54	18.39	4.15	+ .0025	- .08
13	.0258	3.54	18.45	3.81	+ .0009	- .10
14	.0278	3.54	18.51	3.47	- .0010	- .09
15	+1.0298	-3.53	+18.56	- 3.12	-0.0025	-0.07
16	.0318	3.53	18.61	2.78	- .0033	- .02
17	.0338	3.53	18.65	2.43	- .0031	+ .03
18	.0358	3.53	18.68	2.09	- .0019	+ .07
19	.0378	3.52	18.71	1.74	- .0001	+ .09
20	+1.0398	-3.52	+18.74	- 1.39	+0.0020	+0.10
21	.0418	3.51	18.76	1.04	+ .0038	+ .08
22	.0438	3.50	18.77	0.69	+ .0049	+ .05
23	.0458	3.50	18.78	- 0.34	+ .0053	+ .01
24	.0477	3.49	18.78	+ 0.01	+ .0048	- .03
25	+1.0497	-3.48	+18.78	+ 0.36	+0.0037	-0.06
26	.0517	3.47	18.77	0.71	+ .0020	- .08
27	.0537	3.46	18.76	1.06	.0000	- .09
28	.0557	3.45	18.74	1.41	- .0019	- .08
29	.0576	3.44	18.71	1.76	- .0036	- .06
30	+1.0596	-3.43	+18.68	+ 2.11	-0.0048	-0.03
Oct. 1	+1.0616	-3.42	+18.64	+ 2.45	-0.0053	+0.01

$$E = + 0^s.003$$

BESSELIAN DAY NUMBERS, 1935

Date	A	B	C	D	A'	B'
Oct. 1	+1.0616	-3.42	+18.64	+ 2.45	-0.0053	+0.01
2	.0636	3.41	18.60	2.80	- .0049	+ .05
3	.0656	3.39	18.56	3.15	- .0038	+ .08
4	.0676	3.38	18.50	3.50	- .0020	+ .09
5	.0697	3.37	18.44	3.84	.0000	+ .09
6	+1.0717	-3.35	+18.38	+ 4.19	+0.0019	+0.06
7	.0737	3.33	18.31	4.53	+ .0031	+ .02
8	.0758	3.32	18.24	4.88	+ .0033	- .03
9	.0779	3.30	18.16	5.22	+ .0026	- .07
10	.0800	3.28	18.07	5.56	+ .0011	- .10
11	+1.0821	-3.27	+17.98	+ 5.90	-0.0008	-0.10
12	.0842	3.25	17.89	6.24	- .0025	- .08
13	.0863	3.23	17.79	6.57	- .0035	- .04
14	.0885	3.21	17.68	6.91	- .0036	+ .01
15	.0907	3.19	17.57	7.24	- .0026	+ .06
16	+1.0929	-3.17	+17.45	+ 7.57	-0.0009	+0.09
17	.0951	3.15	17.33	7.90	+ .0013	+ .10
18	.0973	3.13	17.20	8.22	+ .0032	+ .09
19	.0996	3.10	17.06	8.55	+ .0047	+ .06
20	.1018	3.08	16.93	8.87	+ .0054	+ .02
21	+1.1041	-3.06	+16.78	+ 9.19	+0.0052	-0.02
22	.1065	3.03	16.63	9.50	+ .0043	- .05
23	.1088	3.01	16.48	9.82	+ .0027	- .08
24	.1112	2.99	16.32	10.13	+ .0008	- .09
25	.1136	2.96	16.16	10.43	- .0012	- .08
26	+1.1160	-2.94	+15.99	+10.74	-0.0029	-0.06
27	.1185	2.91	15.81	11.04	- .0042	- .04
28	.1210	2.88	15.63	11.34	- .0049	.00
29	.1235	2.86	15.45	11.64	- .0048	+ .04
30	.1260	2.83	15.26	11.93	- .0038	+ .07
31	+1.1286	-2.81	+15.07	+12.22	-0.0023	+0.09
Nov. 1	.1312	2.78	14.87	12.50	- .0004	+ .09
2	.1338	2.75	14.67	12.78	+ .0015	+ .07
3	.1365	2.72	14.46	13.06	+ .0029	+ .03
4	.1392	2.70	14.25	13.33	+ .0035	- .01
5	+1.1419	-2.67	+14.03	+13.60	+0.0030	-0.06
6	.1447	2.64	13.81	13.87	+ .0016	- .09
7	.1475	2.62	13.59	14.13	- .0003	- .10
8	.1503	2.59	13.36	14.39	- .0022	- .09
9	.1532	2.56	13.13	14.64	- .0036	- .05
10	+1.1561	-2.53	+12.89	+14.89	-0.0040	-0.01
11	.1590	2.51	12.65	15.13	- .0034	+ .04
12	.1619	2.48	12.40	15.37	- .0019	+ .08
13	.1649	2.45	12.15	15.61	+ .0002	+ .10
14	.1679	2.42	11.90	15.84	+ .0024	+ .09
15	+1.1710	-2.39	+11.64	+16.06	+0.0042	+0.07
16	+1.1740	-2.37	+11.38	+16.28	+0.0052	+0.04

$E = + 0^s.002$

BESSELIAN DAY NUMBERS, 1935

273

Date	A	B	C	D	A'	B'
Nov. 16	+1.1740	-2.37	+11.38	+16.28	+0.0052	+0.04
17	.1771	2.34	11.12	16.50	+ .0053	- .01
18	.1803	2.31	10.85	16.71	+ .0045	- .04
19	.1834	2.29	10.58	16.91	+ .0032	- .07
20	.1866	2.26	10.30	17.12	+ .0014	- .09
21	+1.1899	-2.24	+10.02	+17.31	-0.0006	-0.09
22	.1931	2.21	9.74	17.50	- .0024	- .07
23	.1964	2.18	9.46	17.69	- .0039	- .04
24	.1997	2.16	9.17	17.86	- .0047	- .01
25	.2030	2.13	8.88	18.04	- .0048	+ .03
26	+1.2064	-2.11	+ 8.58	+18.21	-0.0041	+0.06
27	.2098	2.09	8.29	18.37	- .0027	+ .08
28	.2132	2.06	7.99	18.53	- .0008	+ .09
29	.2167	2.04	7.69	18.68	+ .0012	+ .08
30	.2201	2.02	7.38	18.82	+ .0028	+ .05
Dec. 1	+1.2236	-1.99	+ 7.08	+18.96	+0.0036	0.00
2	.2271	1.97	6.77	19.09	+ .0035	- .04
3	.2307	1.95	6.46	19.22	+ .0023	- .08
4	.2342	1.93	6.14	19.34	+ .0005	- .10
5	.2378	1.91	5.83	19.46	- .0015	- .09
6	+1.2414	-1.89	+ 5.51	+19.57	-0.0032	-0.07
7	.2450	1.87	5.19	19.67	- .0040	- .02
8	.2486	1.85	4.87	19.77	- .0038	+ .03
9	.2523	1.83	4.55	19.86	- .0026	+ .07
10	.2560	1.82	4.23	19.94	- .0007	+ .09
11	+1.2596	-1.80	+ 3.90	+20.02	+0.0015	+0.10
12	.2633	1.78	3.57	20.10	+ .0035	+ .08
13	.2670	1.77	3.25	20.16	+ .0048	+ .05
14	.2707	1.75	2.92	20.22	+ .0052	+ .01
15	.2745	1.74	2.59	20.27	+ .0048	- .03
16	+1.2782	-1.73	+ 2.26	+20.32	+0.0036	-0.07
17	.2819	1.71	1.93	20.36	+ .0019	- .08
18	.2857	1.70	1.59	20.40	- .0001	- .09
19	.2895	1.69	1.26	20.42	- .0019	- .08
20	.2932	1.68	0.93	20.44	- .0035	- .06
21	+1.2970	-1.67	+ 0.59	+20.46	-0.0046	-0.02
22	.3008	1.66	+ 0.26	20.47	- .0049	+ .02
23	.3045	1.65	- 0.07	20.47	- .0044	+ .05
24	.3083	1.64	0.41	20.46	- .0032	+ .08
25	.3121	1.64	0.74	20.45	- .0014	+ .09
26	+1.3158	-1.63	- 1.07	+20.44	+0.0006	+0.08
27	.3196	1.62	1.41	20.41	+ .0024	+ .06
28	.3233	1.62	1.74	20.38	+ .0036	+ .02
29	.3271	1.61	2.07	20.34	+ .0038	- .03
30	.3308	1.61	2.40	20.30	+ .0030	- .07
31	+1.3346	-1.61	- 2.74	+20.25	+0.0014	-0.09
32	+1.3383	-1.60	- 3.07	+20.20	-0.0006	-0.10

Nov. 16-Dec. 10, $E = + 0^s.002$

Dec. 11-32, $E = + 0^s.003$

INDEPENDENT DAY NUMBERS, 1935

Date	<i>f</i>	<i>g</i>	log <i>g</i>	<i>G</i>	<i>h</i>	log <i>h</i>	<i>H</i>	<i>i</i>	log <i>i</i>
Jan. 1	+0.903	7.36	0.8666	^h 21 ^m 32.3	20.43	1.3102	^h 23 ^m 24.6	-1.36	0.135 <i>n</i>
2	0.914	7.41	0.8701	21 33.6	20.41	1.3099	23 20.8	1.51	0.178 <i>n</i>
3	0.926	7.47	0.8736	21 34.9	20.40	1.3097	23 17.1	1.65	0.217 <i>n</i>
4	0.938	7.54	0.8771	21 36.3	20.39	1.3095	23 13.3	1.79	0.253 <i>n</i>
5	0.949	7.60	0.8807	21 37.6	20.38	1.3092	23 09.5	1.93	0.286 <i>n</i>
6	+0.961	7.66	0.8844	21 38.9	20.37	1.3089	23 05.7	-2.07	0.316 <i>n</i>
7	0.972	7.73	0.8880	21 40.1	20.35	1.3086	23 01.9	2.21	0.345 <i>n</i>
8	0.984	7.79	0.8915	21 41.3	20.33	1.3082	22 58.1	2.35	0.371 <i>n</i>
9	0.995	7.85	0.8950	21 42.4	20.32	1.3079	22 54.3	2.49	0.396 <i>n</i>
10	1.007	7.92	0.8985	21 43.5	20.30	1.3075	22 50.5	2.63	0.419 <i>n</i>
11	+1.018	7.98	0.9020	21 44.6	20.28	1.3071	22 46.7	-2.76	0.441 <i>n</i>
12	1.029	8.04	0.9055	21 45.6	20.26	1.3067	22 42.9	2.90	0.462 <i>n</i>
13	1.040	8.11	0.9089	21 46.6	20.24	1.3063	22 39.1	3.03	0.482 <i>n</i>
14	1.051	8.17	0.9123	21 47.5	20.22	1.3058	22 35.3	3.17	0.501 <i>n</i>
15	1.062	8.24	0.9157	21 48.4	20.20	1.3054	22 31.5	3.30	0.519 <i>n</i>
16	+1.073	8.30	0.9191	21 49.3	20.18	1.3049	22 27.6	-3.43	0.536 <i>n</i>
17	1.084	8.37	0.9225	21 50.2	20.16	1.3044	22 23.8	3.56	0.552 <i>n</i>
18	1.094	8.43	0.9258	21 51.1	20.13	1.3039	22 19.9	3.69	0.567 <i>n</i>
19	1.105	8.49	0.9290	21 51.9	20.11	1.3034	22 16.0	3.82	0.582 <i>n</i>
20	1.116	8.55	0.9322	21 52.6	20.09	1.3029	22 12.1	3.95	0.596 <i>n</i>
21	+1.126	8.62	0.9354	21 53.3	20.06	1.3023	22 08.3	-4.07	0.6101 <i>n</i>
22	1.137	8.68	0.9386	21 54.1	20.04	1.3018	22 04.4	4.20	0.6232 <i>n</i>
23	1.147	8.74	0.9417	21 54.7	20.01	1.3012	22 00.5	4.32	0.6358 <i>n</i>
24	1.157	8.81	0.9448	21 55.4	19.98	1.3006	21 56.6	4.44	0.6479 <i>n</i>
25	1.168	8.87	0.9479	21 56.1	19.95	1.3000	21 52.7	4.56	0.6595 <i>n</i>
26	+1.178	8.93	0.9509	21 56.7	19.93	1.2994	21 48.7	-4.68	0.6706 <i>n</i>
27	1.188	8.99	0.9539	21 57.3	19.90	1.2988	21 44.8	4.80	0.6814 <i>n</i>
28	1.197	9.06	0.9569	21 57.8	19.87	1.2982	21 40.8	4.92	0.6918 <i>n</i>
29	1.207	9.12	0.9598	21 58.4	19.84	1.2976	21 36.9	5.03	0.7018 <i>n</i>
30	1.217	9.18	0.9627	21 58.9	19.81	1.2969	21 32.9	5.15	0.7114 <i>n</i>
31	+1.226	9.24	0.9655	21 59.5	19.78	1.2963	21 28.9	-5.26	0.7207 <i>n</i>
Feb. 1	1.236	9.30	0.9683	22 00.0	19.75	1.2956	21 24.9	5.37	0.7296 <i>n</i>
2	1.245	9.36	0.9711	22 00.5	19.72	1.2950	21 20.9	5.47	0.7382 <i>n</i>
3	1.255	9.41	0.9738	22 00.9	19.70	1.2944	21 16.9	5.58	0.7466 <i>n</i>
4	1.264	9.47	0.9765	22 01.4	19.67	1.2937	21 12.9	5.68	0.7546 <i>n</i>
5	+1.273	9.53	0.9791	22 01.8	19.64	1.2931	21 08.8	-5.78	0.7623 <i>n</i>
6	1.282	9.59	0.9816	22 02.3	19.61	1.2924	21 04.8	5.88	0.7698 <i>n</i>
7	1.291	9.64	0.9841	22 02.7	19.58	1.2918	21 00.7	5.98	0.7770 <i>n</i>
8	1.300	9.70	0.9866	22 03.1	19.55	1.2911	20 56.6	6.08	0.7840 <i>n</i>
9	1.308	9.75	0.9891	22 03.5	19.52	1.2904	20 52.5	6.18	0.7907 <i>n</i>
10	+1.317	9.81	0.9915	22 03.9	19.49	1.2898	20 48.4	-6.27	0.7972 <i>n</i>
11	1.325	9.86	0.9940	22 04.3	19.46	1.2891	20 44.3	6.36	0.8034 <i>n</i>
12	1.334	9.92	0.9964	22 04.6	19.43	1.2884	20 40.2	6.45	0.8095 <i>n</i>
13	1.342	9.97	0.9987	22 05.0	19.40	1.2878	20 36.1	6.54	0.8153 <i>n</i>
14	1.350	10.02	1.0010	22 05.3	19.37	1.2871	20 32.0	6.62	0.8209 <i>n</i>
15	+1.358	10.07	1.0032	22 05.7	19.34	1.2865	20 27.9	-6.70	0.8263 <i>n</i>
16	+1.366	10.13	1.0054	22 06.1	19.31	1.2858	20 23.7	-6.78	0.8315 <i>n</i>

INDEPENDENT DAY NUMBERS, 1935

275

Date	Sidereal Time	τ	f'	g'	G'	$I + \pi$	$I + \gamma$	$\frac{g'}{g_0}$	j	J
Jan.	1	^h 6.6	—0.0008	—0.018	^h 0.12	11.4	0.367	1.104	0.006	^h 15 ^m 32
	2	6.7	+0.0019	—0.015	0.12	9.9	0.370	1.103	0.006	15 34
	3	6.8	0.0047	—0.010	0.11	8.3	0.373	1.103	0.006	15 35
	4	6.8	0.0074	—0.003	0.10	6.7	0.376	1.103	0.005	15 36
	5	6.9	0.0102	+0.005	0.09	4.6	0.379	1.102	0.005	15 38
	6	7.0	0.0129	+0.011	0.09	2.4	0.382	1.101	0.005	15 39
	7	7.0	0.0156	+0.015	0.10	0.2	0.385	1.100	0.005	15 40
	8	7.1	0.0184	+0.015	0.11	22.3	0.388	0.999	0.005	15 41
	9	7.2	0.0211	+0.011	0.11	20.7	0.392	0.998	0.006	15 42
	10	7.2	0.0238	+0.006	0.11	19.3	0.395	0.997	0.006	15 44
	11	7.3	0.0266	—0.001	0.10	17.8	0.398	1.096	0.005	15 45
	12	7.4	0.0293	—0.006	0.08	15.9	0.401	0.995	0.004	15 46
	13	7.4	0.0321	—0.009	0.07	13.5	0.404	0.994	0.003	15 47
	14	7.5	0.0348	—0.009	0.07	10.7	0.408	0.993	0.003	15 48
	15	7.6	0.0375	—0.007	0.08	8.3	0.411	0.992	0.004	15 48
	16	7.6	0.0403	—0.002	0.09	6.6	0.414	1.091	0.005	15 49
	17	7.7	0.0430	+0.003	0.10	5.2	0.417	0.990	0.005	15 50
	18	7.8	0.0458	+0.008	0.10	3.9	0.420	0.988	0.005	15 51
	19	7.8	0.0485	+0.012	0.10	2.5	0.423	0.987	0.005	15 52
	20	7.9	0.0512	+0.014	0.09	1.0	0.427	0.986	0.005	15 53
	21	8.0	0.0540	+0.013	0.09	23.3	0.430	1.084	0.004	15 53
	22	8.0	0.0567	+0.010	0.08	21.5	0.433	0.983	0.004	15 54
	23	8.1	0.0594	+0.005	0.08	19.6	0.436	0.982	0.004	15 55
	24	8.2	0.0622	—0.001	0.09	17.9	0.439	0.980	0.005	15 55
	25	8.2	0.0649	—0.007	0.10	16.2	0.442	0.979	0.005	15 56
	26	8.3	0.0677	—0.013	0.11	14.7	0.445	1.077	0.005	15 57
	27	8.4	0.0704	—0.017	0.12	13.3	0.448	0.976	0.006	15 57
	28	8.4	0.0731	—0.018	0.12	11.9	0.452	0.974	0.006	15 58
	29	8.5	0.0759	—0.017	0.12	10.5	0.455	0.973	0.006	15 58
	30	8.6	0.0786	—0.013	0.12	9.0	0.458	0.971	0.006	15 59
Feb.	31	8.6	0.0813	—0.006	0.11	7.5	0.461	1.069	0.005	15 59
	1	8.7	0.0841	+0.001	0.10	5.7	0.464	0.968	0.005	16 00
	2	8.8	0.0868	+0.008	0.09	3.5	0.467	0.966	0.004	16 00
	3	8.8	0.0896	+0.013	0.09	1.0	0.470	0.965	0.004	16 01
	4	8.9	0.0923	+0.014	0.10	22.9	0.472	0.963	0.005	16 01
	5	8.9	0.0950	+0.012	0.11	21.1	0.475	1.062	0.005	16 02
	6	9.0	0.0978	+0.007	0.11	19.7	0.478	0.960	0.006	16 02
	7	9.1	0.1005	+0.001	0.10	18.3	0.481	0.958	0.005	16 03
	8	9.1	0.1032	—0.005	0.09	16.7	0.484	0.957	0.004	16 03
	9	9.2	0.1060	—0.008	0.07	14.5	0.486	0.955	0.003	16 03
	10	9.3	0.1087	—0.009	0.06	11.5	0.489	1.053	0.003	16 04
	11	9.3	0.1115	—0.007	0.07	8.8	0.492	0.952	0.004	16 04
	12	9.4	0.1142	—0.003	0.09	6.9	0.495	0.950	0.004	16 05
	13	9.5	0.1169	+0.002	0.10	5.4	0.497	0.949	0.005	16 05
	14	9.5	0.1197	+0.008	0.10	4.1	0.500	0.947	0.005	16 05
	15	9.6	0.1224	+0.012	0.10	2.8	0.502	1.046	0.005	16 06
	16	9.7	0.1251	+0.014	0.10	1.3	0.505	1.044	0.005	16 06

INDEPENDENT DAY NUMBERS, 1935

Date	<i>f</i>	<i>g</i>	log <i>g</i>	<i>G</i>	<i>h</i>	log <i>h</i>	<i>H</i>	<i>i</i>	log <i>i</i>
Feb. 16	+1.366	10.13	1.0054	22 06.1	19.31	1.2858	20 23.7	-6.78	0.8315 <i>n</i>
17	1.374	10.18	1.0076	22 06.4	19.28	1.2852	20 19.5	6.86	0.8364 <i>n</i>
18	1.382	10.23	1.0098	22 06.7	19.26	1.2846	20 15.3	6.94	0.8412 <i>n</i>
19	1.390	10.28	1.0119	22 07.1	19.23	1.2840	20 11.1	7.01	0.8458 <i>n</i>
20	1.397	10.33	1.0139	22 07.4	19.20	1.2834	20 06.9	7.08	0.8503 <i>n</i>
21	+1.405	10.37	1.0158	22 07.7	19.18	1.2828	20 02.7	-7.15	0.8545 <i>n</i>
22	1.413	10.42	1.0178	22 08.1	19.16	1.2823	19 58.5	7.22	0.8586 <i>n</i>
23	1.420	10.46	1.0197	22 08.4	19.13	1.2817	19 54.3	7.29	0.8625 <i>n</i>
24	1.427	10.51	1.0216	22 08.7	19.11	1.2812	19 50.1	7.35	0.8662 <i>n</i>
25	1.434	10.56	1.0235	22 09.1	19.08	1.2806	19 45.8	7.41	0.8698 <i>n</i>
26	+1.442	10.60	1.0254	22 09.4	19.06	1.2801	19 41.5	-7.47	0.8733 <i>n</i>
27	1.449	10.65	1.0272	22 09.7	19.04	1.2796	19 37.3	7.52	0.8764 <i>n</i>
28	1.456	10.69	1.0289	22 10.0	19.02	1.2791	19 33.0	7.58	0.8795 <i>n</i>
Mar. 1	1.463	10.73	1.0307	22 10.4	19.00	1.2787	19 28.7	7.63	0.8824 <i>n</i>
2	1.470	10.78	1.0325	22 10.7	18.98	1.2782	19 24.5	7.68	0.8852 <i>n</i>
3	+1.476	10.82	1.0342	22 11.1	18.96	1.2778	19 20.2	-7.72	0.8878 <i>n</i>
4	1.483	10.86	1.0358	22 11.4	18.94	1.2774	19 15.9	7.77	0.8903 <i>n</i>
5	1.490	10.90	1.0374	22 11.8	18.92	1.2770	19 11.6	7.81	0.8926 <i>n</i>
6	1.497	10.94	1.0390	22 12.1	18.91	1.2766	19 07.3	7.85	0.8948 <i>n</i>
7	1.503	10.98	1.0405	22 12.5	18.89	1.2762	19 03.0	7.89	0.8968 <i>n</i>
8	+1.510	11.02	1.0421	22 12.9	18.88	1.2759	18 58.7	-7.92	0.8987 <i>n</i>
9	1.516	11.06	1.0437	22 13.2	18.86	1.2756	18 54.3	7.95	0.9005 <i>n</i>
10	1.523	11.10	1.0452	22 13.6	18.85	1.2753	18 50.0	7.98	0.9021 <i>n</i>
11	1.529	11.13	1.0466	22 14.0	18.84	1.2750	18 45.7	8.01	0.9036 <i>n</i>
12	1.536	11.17	1.0480	22 14.4	18.83	1.2748	18 41.4	8.03	0.9049 <i>n</i>
13	+1.542	11.21	1.0495	22 14.8	18.82	1.2746	18 37.1	-8.06	0.9061 <i>n</i>
14	1.548	11.24	1.0509	22 15.2	18.81	1.2744	18 32.7	8.08	0.9072 <i>n</i>
15	1.555	11.28	1.0523	22 15.6	18.80	1.2742	18 28.4	8.09	0.9081 <i>n</i>
16	1.561	11.31	1.0536	22 16.0	18.79	1.2740	18 24.1	8.11	0.9089 <i>n</i>
17	1.567	11.35	1.0549	22 16.5	18.79	1.2739	18 19.7	8.12	0.9095 <i>n</i>
18	+1.574	11.38	1.0563	22 16.9	18.78	1.2738	18 15.4	-8.13	0.9101 <i>n</i>
19	1.580	11.42	1.0576	22 17.3	18.78	1.2738	18 11.1	8.14	0.9105 <i>n</i>
20	1.586	11.45	1.0589	22 17.8	18.78	1.2737	18 06.7	8.14	0.9107 <i>n</i>
21	1.592	11.49	1.0602	22 18.3	18.78	1.2737	18 02.4	8.15	0.9109 <i>n</i>
22	1.599	11.52	1.0614	22 18.7	18.78	1.2737	17 58.1	8.15	0.9109 <i>n</i>
23	+1.605	11.55	1.0627	22 19.2	18.78	1.2737	17 53.7	-8.14	0.9108 <i>n</i>
24	1.611	11.59	1.0640	22 19.7	18.78	1.2738	17 49.4	8.14	0.9105 <i>n</i>
25	1.617	11.62	1.0652	22 20.2	18.78	1.2738	17 45.1	8.13	0.9101 <i>n</i>
26	1.623	11.65	1.0664	22 20.7	18.79	1.2739	17 40.7	8.12	0.9096 <i>n</i>
27	1.630	11.68	1.0676	22 21.3	18.80	1.2741	17 36.4	8.11	0.9090 <i>n</i>
28	+1.636	11.72	1.0688	22 21.8	18.80	1.2742	17 32.1	-8.09	0.9082 <i>n</i>
29	1.642	11.75	1.0700	22 22.3	18.81	1.2744	17 27.8	8.08	0.9073 <i>n</i>
30	1.649	11.78	1.0712	22 22.9	18.82	1.2746	17 23.5	8.06	0.9062 <i>n</i>
31	1.655	11.81	1.0724	22 23.4	18.83	1.2748	17 19.3	8.04	0.9051 <i>n</i>
Apr. 1	1.661	11.85	1.0736	22 24.0	18.84	1.2750	17 15.0	8.01	0.9038 <i>n</i>
2	+1.668	11.88	1.0748	22 24.5	18.85	1.2753	17 10.7	-7.99	0.9023 <i>n</i>
3	+1.674	11.91	1.0759	22 25.1	18.86	1.2755	17 06.5	-7.96	0.9008 <i>n</i>

INDEPENDENT DAY NUMBERS, 1935

277

Date	Sidereal Time	τ	f'	g'	G'	$I + \pi$	$I + \gamma$	$\frac{g'}{g_0}$	j	J
	^h		^a	^{g'}	^h					^h ^m
Feb. 16	9.7	0.1251	+0.014	0.10	1.3	0.505	1.044	0.005	0.04	16 06
17	9.7	.1279	+ .014	.09	23.9	.508	.042	.005	.04	16 06
18	9.8	.1306	+ .012	.09	22.1	.510	.041	.004	.04	16 07
19	9.9	.1334	+ .008	.09	20.3	.513	.040	.004	.04	16 07
20	9.9	.1361	+ .002	.09	18.5	.515	.038	.004	.05	16 07
21	10.0	0.1388	-0.004	0.10	16.9	0.517	1.037	0.005	0.05	16 08
22	10.1	.1416	- .010	.10	15.3	.520	.035	.005	.05	16 08
23	10.1	.1443	- .015	.11	13.8	.522	.034	.005	.05	16 08
24	10.2	.1471	- .018	.12	12.3	.524	.033	.006	.05	16 09
25	10.3	.1498	- .018	.12	10.9	.526	.031	.006	.05	16 09
26	10.3	0.1525	-0.015	0.12	9.6	0.529	1.030	0.006	0.05	16 09
27	10.4	.1553	- .009	.11	8.1	.531	.029	.006	.05	16 10
28	10.5	.1580	- .002	.10	6.5	.533	.028	.005	.05	16 10
Mar. 1	10.5	.1607	+ .005	.09	4.5	.535	.027	.004	.05	16 10
2	10.6	.1635	+ .010	.08	2.0	.537	.026	.004	.05	16 11
3	10.7	0.1662	+0.013	0.08	23.4	0.540	1.025	0.004	0.05	16 11
4	10.7	.1690	+ .012	.10	21.5	.542	.024	.005	.05	16 11
5	10.8	.1717	+ .008	.11	19.9	.544	.023	.005	.05	16 12
6	10.9	.1744	+ .002	.11	18.5	.546	.022	.005	.05	16 12
7	10.9	.1772	- .004	.10	17.0	.547	.021	.005	.05	16 12
8	11.0	0.1799	-0.008	0.08	15.1	0.549	1.020	0.004	0.05	16 13
9	11.1	.1826	- .010	.07	12.5	.551	.020	.003	.05	16 13
10	11.1	.1854	- .008	.07	9.6	.553	.019	.003	.05	16 14
11	11.2	.1881	- .005	.08	7.4	.555	.018	.004	.05	16 14
12	11.2	.1909	+ .001	.10	5.9	.557	.018	.005	.05	16 14
13	11.3	0.1936	+0.006	0.11	4.4	0.559	1.017	0.005	0.05	16 15
14	11.4	.1963	+ .011	.11	3.1	.561	.017	.005	.05	16 15
15	11.4	.1991	+ .014	.10	1.8	.563	.016	.005	.05	16 16
16	11.5	.2018	+ .015	.10	0.3	.564	.016	.005	.05	16 16
17	11.6	.2045	+ .013	.09	22.7	.566	.016	.005	.05	16 16
18	11.6	0.2073	+0.010	0.09	20.9	0.568	1.015	0.004	0.05	16 17
19	11.7	.2100	+ .004	.09	19.3	.569	.015	.004	.05	16 17
20	11.8	.2128	- .002	.09	17.6	.571	.015	.005	.05	16 18
21	11.8	.2155	- .008	.10	15.9	.573	.015	.005	.05	16 18
22	11.9	.2182	- .013	.10	14.3	.574	.015	.005	.05	16 19
23	12.0	0.2210	-0.016	0.11	12.8	0.576	1.015	0.005	0.05	16 19
24	12.0	.2237	- .017	.11	11.3	.578	.015	.006	.05	16 20
25	12.1	.2265	- .015	.11	9.9	.579	.015	.006	.05	16 20
26	12.2	.2292	- .010	.11	8.5	.581	.016	.006	.05	16 21
27	12.2	.2319	- .004	.10	6.9	.583	.016	.005	.05	16 21
28	12.3	0.2347	+0.003	0.09	5.1	0.584	1.016	0.004	0.05	16 22
29	12.4	.2374	+ .009	.08	2.8	.586	.017	.004	.05	16 22
30	12.4	.2401	+ .012	.08	0.2	.588	.017	.004	.05	16 23
31	12.5	.2429	+ .012	.09	21.9	.589	.018	.004	.05	16 23
Apr. 1	12.6	.2456	+ .008	.10	20.1	.591	.018	.005	.05	16 24
2	12.6	0.2484	+0.003	0.11	18.7	0.592	1.019	0.005	0.05	16 25
3	12.7	0.2511	-0.003	0.10	17.2	0.594	1.019	0.005	0.05	16 25

Date	<i>f</i>	<i>g</i>	log <i>g</i>	<i>G</i>	<i>h</i>	log <i>h</i>	<i>H</i>	<i>i</i>	log <i>i</i>
Apr. 1	+1.661	11.85	1.0736	22 24.0	18.84	1.2750	17 15.0	-8.01	0.9038 <i>n</i>
2	1.668	11.88	1.0748	22 24.5	18.85	1.2753	17 10.7	7.99	0.9023 <i>n</i>
3	1.674	11.91	1.0759	22 25.1	18.86	1.2755	17 06.5	7.96	0.9008 <i>n</i>
4	1.681	11.94	1.0771	22 25.8	18.87	1.2758	17 02.2	7.93	0.8991 <i>n</i>
5	1.687	11.98	1.0783	22 26.4	18.89	1.2762	16 57.9	7.89	0.8972 <i>n</i>
6	+1.694	12.01	1.0795	22 27.0	18.90	1.2765	16 53.7	-7.86	0.8953 <i>n</i>
7	1.700	12.04	1.0807	22 27.6	18.92	1.2769	16 49.5	7.82	0.8932 <i>n</i>
8	1.707	12.08	1.0819	22 28.3	18.93	1.2772	16 45.3	7.78	0.8909 <i>n</i>
9	1.714	12.11	1.0831	22 28.9	18.95	1.2776	16 41.1	7.74	0.8886 <i>n</i>
10	1.720	12.14	1.0843	22 29.5	18.97	1.2781	16 36.9	7.69	0.8860 <i>n</i>
11	+1.727	12.18	1.0856	22 30.2	18.99	1.2785	16 32.7	-7.65	0.8834 <i>n</i>
12	1.734	12.21	1.0868	22 30.9	19.01	1.2789	16 28.5	7.60	0.8806 <i>n</i>
13	1.741	12.25	1.0880	22 31.5	19.03	1.2794	16 24.3	7.54	0.8776 <i>n</i>
14	1.748	12.28	1.0891	22 32.2	19.05	1.2799	16 20.1	7.49	0.8745 <i>n</i>
15	1.755	12.31	1.0903	22 32.9	19.07	1.2804	16 16.0	7.44	0.8713 <i>n</i>
16	+1.762	12.35	1.0916	22 33.5	19.09	1.2809	16 11.9	-7.38	0.8679 <i>n</i>
17	1.769	12.38	1.0928	22 34.2	19.12	1.2814	16 07.7	7.32	0.8643 <i>n</i>
18	1.776	12.42	1.0941	22 34.9	19.14	1.2820	16 03.6	7.25	0.8606 <i>n</i>
19	1.784	12.46	1.0954	22 35.7	19.16	1.2825	15 59.5	7.19	0.8567 <i>n</i>
20	1.791	12.49	1.0967	22 36.4	19.19	1.2831	15 55.5	7.12	0.8527 <i>n</i>
21	+1.799	12.53	1.0979	22 37.1	19.22	1.2837	15 51.4	-7.06	0.8485 <i>n</i>
22	1.806	12.57	1.0992	22 37.8	19.24	1.2842	15 47.3	6.99	0.8442 <i>n</i>
23	1.814	12.61	1.1006	22 38.5	19.27	1.2848	15 43.3	6.91	0.8397 <i>n</i>
24	1.821	12.65	1.1020	22 39.3	19.29	1.2854	15 39.3	6.84	0.8350 <i>n</i>
25	1.829	12.69	1.1033	22 40.0	19.32	1.2860	15 35.2	6.76	0.8301 <i>n</i>
26	+1.837	12.72	1.1046	22 40.7	19.35	1.2866	15 31.2	-6.68	0.8251 <i>n</i>
27	1.845	12.76	1.1060	22 41.5	19.38	1.2873	15 27.2	6.60	0.8198 <i>n</i>
28	1.853	12.80	1.1073	22 42.2	19.40	1.2879	15 23.3	6.52	0.8144 <i>n</i>
29	1.861	12.84	1.1087	22 42.9	19.43	1.2885	15 19.3	6.44	0.8088 <i>n</i>
30	1.869	12.89	1.1101	22 43.7	19.46	1.2891	15 15.3	6.35	0.8030 <i>n</i>
May 1	+1.877	12.93	1.1116	22 44.4	19.49	1.2898	15 11.4	-6.27	0.7970 <i>n</i>
2	1.886	12.97	1.1131	22 45.1	19.52	1.2904	15 07.5	6.18	0.7908 <i>n</i>
3	1.894	13.02	1.1145	22 45.9	19.54	1.2910	15 03.6	6.09	0.7844 <i>n</i>
4	1.903	13.06	1.1159	22 46.6	19.57	1.2917	14 59.7	5.99	0.7777 <i>n</i>
5	1.911	13.10	1.1174	22 47.3	19.60	1.2923	14 55.8	5.90	0.7708 <i>n</i>
6	+1.920	13.15	1.1190	22 48.1	19.63	1.2929	14 51.9	-5.80	0.7637 <i>n</i>
7	1.929	13.20	1.1205	22 48.9	19.66	1.2936	14 48.1	5.71	0.7564 <i>n</i>
8	1.938	13.24	1.1220	22 49.6	19.69	1.2942	14 44.3	5.61	0.7488 <i>n</i>
9	1.947	13.29	1.1236	22 50.3	19.72	1.2948	14 40.4	5.51	0.7409 <i>n</i>
10	1.956	13.34	1.1252	22 51.0	19.74	1.2954	14 36.6	5.41	0.7328 <i>n</i>
11	+1.965	13.39	1.1268	22 51.7	19.77	1.2960	14 32.8	-5.30	0.7244 <i>n</i>
12	1.974	13.44	1.1284	22 52.5	19.80	1.2966	14 29.0	5.20	0.7157 <i>n</i>
13	1.983	13.49	1.1300	22 53.2	19.82	1.2972	14 25.2	5.09	0.7068 <i>n</i>
14	1.992	13.54	1.1317	22 53.9	19.85	1.2978	14 21.4	4.98	0.6975 <i>n</i>
15	2.002	13.60	1.1334	22 54.6	19.88	1.2984	14 17.7	4.87	0.6878 <i>n</i>
16	+2.011	13.65	1.1351	22 55.3	19.91	1.2990	14 13.9	-4.76	0.6779 <i>n</i>
17	+2.021	13.70	1.1367	22 56.0	19.94	1.2996	14 10.2	-4.65	0.6676 <i>n</i>

INDEPENDENT DAY NUMBERS, 1935

279

Date	Sidereal Time	τ	f''	g'	G'	$I + \pi$	$I + \gamma$	$\frac{g'}{g_0}$	j	J
Apr.	^h 12.6	0.2456	^s +0.008	[°] 0.10	^h 20.1	0.591	1.018	0.005	0.05	^h 16 ^m 24
	2 12.6	.2484	+ .003	.11	18.7	.592	.019	.005	.05	16 25
	3 12.7	.2511	— .003	.10	17.2	.594	.019	.005	.05	16 25
	4 12.8	.2538	— .008	.09	15.5	.596	.020	.004	.05	16 26
	5 12.8	.2566	— .010	.07	13.3	.597	.021	.004	.05	16 26
	6 12.9	0.2593	—0.010	0.07	10.7	0.599	1.022	0.003	0.05	16 27
	7 13.0	.2620	— .007	.08	8.2	.601	.023	.004	.05	16 28
	8 13.0	.2648	— .001	.09	6.3	.602	.023	.005	.05	16 28
	9 13.1	.2675	+ .005	.10	4.9	.604	.024	.005	.05	16 29
	10 13.2	.2703	+ .010	.11	3.6	.606	.025	.005	.05	16 30
	11 13.2	0.2730	+0.014	0.11	2.2	0.607	1.026	0.005	0.05	16 30
	12 13.3	.2757	+ .015	.10	0.7	.609	.027	.005	.05	16 31
	13 13.4	.2785	+ .014	.10	23.1	.611	.029	.005	.05	16 32
	14 13.4	.2812	+ .011	.09	21.5	.612	.030	.004	.05	16 32
	15 13.5	.2839	+ .006	.09	19.8	.614	.031	.004	.05	16 33
	16 13.5	0.2867	0.000	0.09	18.1	0.616	1.032	0.005	0.05	16 34
	17 13.6	.2894	— .006	.09	16.5	.618	.033	.005	.05	16 34
	18 13.7	.2922	— .011	.10	14.9	.619	.035	.005	.05	16 35
	19 13.7	.2949	— .015	.10	13.3	.621	.036	.005	.05	16 36
	20 13.8	.2976	— .016	.11	11.7	.623	.037	.005	.05	16 36
	21 13.9	0.3004	—0.015	0.11	10.3	0.625	1.039	0.005	0.05	16 37
	22 13.9	.3031	— .011	.11	8.7	.627	.040	.005	.05	16 38
	23 14.0	.3059	— .005	.10	7.3	.629	.041	.005	.06	16 39
	24 14.1	.3086	+ .002	.09	5.6	.631	.043	.005	.06	16 39
	25 14.1	.3113	+ .008	.08	3.6	.633	.044	.004	.06	16 40
	26 14.2	0.3141	+0.011	0.08	1.1	0.635	1.046	0.004	0.06	16 41
	27 14.3	.3168	+ .012	.08	22.7	.637	.047	.004	.06	16 41
	28 14.3	.3195	+ .010	.09	20.7	.638	.049	.005	.06	16 42
	29 14.4	.3223	+ .004	.10	19.1	.641	.050	.005	.06	16 43
	30 14.5	.3250	— .001	.10	17.7	.643	.052	.005	.06	16 44
May	1 14.5	0.3278	—0.007	0.09	15.9	0.645	1.053	0.005	0.06	16 44
	2 14.6	.3305	— .011	.08	14.1	.647	.055	.004	.06	16 45
	3 14.7	.3332	— .011	.08	11.6	.649	.056	.004	.06	16 46
	4 14.7	.3360	— .009	.08	9.1	.651	.058	.004	.06	16 47
	5 14.8	.3387	— .004	.09	7.1	.653	.060	.004	.06	16 47
	6 14.9	0.3414	+0.002	0.10	5.5	0.656	1.061	0.005	0.06	16 48
	7 14.9	.3442	+ .008	.11	4.0	.658	.063	.005	.06	16 49
	8 15.0	.3469	+ .012	.11	2.7	.660	.064	.005	.06	16 50
	9 15.1	.3497	+ .015	.10	1.2	.663	.065	.005	.06	16 50
	10 15.1	.3524	+ .015	.09	23.7	.665	.067	.005	.06	16 51
	11 15.2	0.3551	+0.012	0.09	22.0	0.667	1.069	0.005	0.06	16 52
	12 15.3	.3579	+ .008	.09	20.3	.670	.070	.004	.06	16 52
	13 15.3	.3606	+ .002	.09	18.6	.673	.072	.004	.06	16 53
	14 15.4	.3633	— .004	.09	16.9	.675	.073	.005	.06	16 54
	15 15.5	.3661	— .010	.10	15.3	.678	.075	.005	.06	16 55
	16 15.5	0.3688	—0.014	0.10	13.7	0.681	1.076	0.005	0.06	16 55
	17 15.6	0.3716	—0.016	0.11	12.2	0.683	1.078	0.005	0.06	16 56

INDEPENDENT DAY NUMBERS, 1935

Date	<i>f</i>	<i>g</i>	log <i>g</i>	<i>G</i>	<i>h</i>	log <i>h</i>	<i>H</i>	<i>i</i>	log <i>i</i>		
May	17	+2.021	13.70	1.1367	^h 22 ^m 56.0	19.94	1.2996	^h 14 ^m 10.2	-4.65	0.668 <i>n</i>	
	18	2.031	13.75	1.1384	22 56.7	19.96	1.3002	14 06.5	4.54	0.657 <i>n</i>	
	19	2.040	13.81	1.1401	22 57.3	19.98	1.3007	14 02.7	4.42	0.646 <i>n</i>	
	20	2.050	13.86	1.1419	22 58.0	20.01	1.3013	13 59.0	4.31	0.634 <i>n</i>	
	21	2.060	13.92	1.1436	22 58.7	20.04	1.3018	13 55.3	4.19	0.622 <i>n</i>	
	22	+2.070	13.98	1.1454	22 59.3	20.06	1.3023	13 51.7	-4.07	0.610 <i>n</i>	
	23	2.080	14.03	1.1472	23 00.0	20.09	1.3029	13 48.0	3.95	0.597 <i>n</i>	
	24	2.090	14.09	1.1489	23 00.6	20.11	1.3034	13 44.3	3.83	0.584 <i>n</i>	
	25	2.100	14.15	1.1507	23 01.2	20.13	1.3039	13 40.7	3.71	0.570 <i>n</i>	
	26	2.111	14.21	1.1525	23 01.9	20.16	1.3044	13 37.1	3.59	0.555 <i>n</i>	
	27	+2.121	14.27	1.1543	23 02.5	20.18	1.3049	13 33.4	-3.47	0.540 <i>n</i>	
	28	2.131	14.33	1.1562	23 03.1	20.20	1.3053	13 29.8	3.34	0.524 <i>n</i>	
	29	2.142	14.39	1.1581	23 03.7	20.22	1.3057	13 26.2	3.22	0.508 <i>n</i>	
	30	2.152	14.45	1.1600	23 04.3	20.23	1.3061	13 22.6	3.09	0.490 <i>n</i>	
	31	2.163	14.52	1.1619	23 04.8	20.25	1.3065	13 19.0	2.97	0.472 <i>n</i>	
	June	1	+2.173	14.58	1.1638	23 05.4	20.27	1.3069	13 15.4	-2.84	0.453 <i>n</i>
		2	2.184	14.64	1.1656	23 05.9	20.29	1.3073	13 11.8	2.71	0.433 <i>n</i>
		3	2.195	14.70	1.1674	23 06.5	20.30	1.3076	13 08.3	2.58	0.412 <i>n</i>
		4	2.205	14.76	1.1692	23 07.0	20.32	1.3080	13 04.7	2.45	0.390 <i>n</i>
		5	2.216	14.83	1.1711	23 07.5	20.34	1.3083	13 01.1	2.32	0.366 <i>n</i>
		6	+2.227	14.90	1.1731	23 08.0	20.35	1.3086	12 57.5	-2.19	0.341 <i>n</i>
		7	2.238	14.96	1.1750	23 08.5	20.37	1.3089	12 54.0	2.06	0.314 <i>n</i>
		8	2.249	15.02	1.1768	23 09.0	20.38	1.3092	12 50.5	1.93	0.286 <i>n</i>
		9	2.260	15.09	1.1787	23 09.5	20.39	1.3094	12 46.9	1.80	0.255 <i>n</i>
		10	2.271	15.16	1.1807	23 09.9	20.40	1.3097	12 43.4	1.67	0.222 <i>n</i>
		11	+2.282	15.23	1.1827	23 10.4	20.41	1.3099	12 39.9	-1.53	0.185 <i>n</i>
		12	2.293	15.30	1.1846	23 10.9	20.42	1.3101	12 36.3	1.40	0.146 <i>n</i>
		13	2.304	15.36	1.1865	23 11.3	20.43	1.3103	12 32.8	1.26	0.102 <i>n</i>
		14	2.315	15.43	1.1884	23 11.7	20.44	1.3104	12 29.3	1.13	0.053 <i>n</i>
		15	2.326	15.50	1.1903	23 12.1	20.45	1.3106	12 25.8	1.00	9.998 <i>n</i>
		16	+2.337	15.57	1.1922	23 12.5	20.45	1.3107	12 22.3	-0.86	9.935 <i>n</i>
17		2.349	15.64	1.1941	23 12.9	20.46	1.3108	12 18.8	0.73	9.861 <i>n</i>	
18		2.360	15.70	1.1960	23 13.2	20.46	1.3109	12 15.3	0.59	9.771 <i>n</i>	
19		2.371	15.78	1.1980	23 13.6	20.46	1.3110	12 11.7	0.45	9.658 <i>n</i>	
20		2.382	15.85	1.1999	23 13.9	20.47	1.3111	12 08.2	0.32	9.504 <i>n</i>	
21		+2.393	15.91	1.2018	23 14.3	20.47	1.3111	12 04.7	-0.18	9.263 <i>n</i>	
22		2.405	15.98	1.2037	23 14.6	20.47	1.3111	12 01.2	-0.05	8.677 <i>n</i>	
23		2.416	16.05	1.2056	23 14.9	20.47	1.3111	11 57.7	+0.09	8.945	
24		2.427	16.13	1.2075	23 15.2	20.47	1.3111	11 54.2	0.22	9.349	
25		2.438	16.20	1.2094	23 15.5	20.47	1.3111	11 50.7	0.36	9.555	
26		+2.449	16.27	1.2113	23 15.8	20.46	1.3110	11 47.2	+0.49	9.694	
27		2.461	16.34	1.2132	23 16.1	20.46	1.3109	11 43.7	0.63	9.799	
28		2.472	16.41	1.2151	23 16.3	20.46	1.3108	11 40.2	0.76	9.883	
29		2.483	16.48	1.2169	23 16.6	20.45	1.3107	11 36.7	0.90	9.954	
30		2.494	16.55	1.2187	23 16.8	20.45	1.3106	11 33.2	1.03	0.015	
July	1	+2.505	16.62	1.2205	23 17.1	20.44	1.3104	11 29.7	+1.17	0.068	
	2	+2.516	16.69	1.2224	23 17.3	20.43	1.3102	11 26.2	+1.30	0.115	

INDEPENDENT DAY NUMBERS, 1935

281

Date	Sidereal Time	τ	f'	g'	G'	$I + \pi$	$I + y$	$\frac{g'}{g_0}$	j	J
May	17 ^h 15.6	0.3716	— 0.016	0.11	12.2	0.683	1.078	0.005	0.06	16 ^h 56 ^m
	18 15.7	.3743	— .016	.11	10.7	.686	.079	.005	.06	16 57
	19 15.7	.3770	— .012	.11	9.2	.689	.080	.005	.06	16 57
	20 15.8	.3798	— .007	.10	7.7	.691	.082	.005	.06	16 58
	21 15.8	.3825	— .000	.10	6.0	.694	.083	.005	.06	16 59
	22 15.9	0.3853	+ 0.007	0.09	4.0	0.697	1.084	0.004	0.06	16 59
	23 16.0	.3880	+ .011	.08	1.8	.700	.086	.004	.06	17 00
	24 16.0	.3907	+ .013	.09	23.5	.703	.087	.004	.06	17 01
	25 16.1	.3935	+ .012	.10	21.5	.706	.088	.005	.06	17 01
	26 16.2	.3962	+ .007	.10	19.8	.709	.090	.005	.06	17 02
	27 16.2	0.3989	+ 0.001	0.10	18.2	0.711	1.091	0.005	0.06	17 02
	28 16.3	.4017	— .005	.10	16.5	.715	.092	.005	.06	17 03
	29 16.4	.4044	— .010	.09	14.7	.718	.093	.004	.06	17 04
	30 16.4	.4072	— .012	.08	12.3	.721	.094	.004	.06	17 04
	31 16.5	.4099	— .010	.08	9.9	.724	.095	.004	.06	17 05
June	1 16.6	0.4126	— 0.006	0.09	7.9	0.727	1.096	0.004	0.06	17 05
	2 16.6	.4154	— .000	.10	6.1	.730	.097	.005	.06	17 06
	3 16.7	.4181	+ .005	.10	4.7	.733	.098	.005	.06	17 06
	4 16.8	.4208	+ .011	.10	3.1	.736	.099	.005	.06	17 07
	5 16.8	.4236	+ .014	.10	1.7	.739	.099	.005	.06	17 08
	6 16.9	0.4263	+ 0.015	0.10	0.1	0.743	1.100	0.005	0.07	17 08
	7 17.0	.4291	+ .013	.09	22.5	.746	.101	.005	.07	17 09
	8 17.0	.4318	+ .009	.09	20.8	.749	.102	.004	.07	17 09
	9 17.1	.4345	+ .004	.09	19.1	.753	.102	.004	.07	17 09
	10 17.2	.4373	— .002	.09	17.3	.756	.103	.005	.07	17 10
	11 17.2	0.4400	— 0.008	0.10	15.7	0.760	1.103	0.005	0.07	17 10
	12 17.3	.4427	— .013	.10	14.2	.763	.104	.005	.07	17 11
	13 17.4	.4455	— .016	.11	12.7	.766	.104	.005	.07	17 11
	14 17.4	.4482	— .016	.11	11.2	.770	.105	.005	.07	17 12
	15 17.5	.4510	— .014	.11	9.7	.773	.105	.005	.07	17 12
	16 17.6	0.4537	— 0.009	0.11	8.2	0.776	1.105	0.005	0.07	17 12
	17 17.6	.4564	— .002	.10	6.6	.780	.106	.005	.07	17 13
	18 17.7	.4592	+ .005	.09	4.7	.783	.106	.004	.07	17 13
	19 17.8	.4619	+ .010	.08	2.5	.787	.106	.004	.07	17 14
	20 17.8	.4647	+ .013	.09	0.2	.790	.106	.004	.07	17 14
	21 17.9	0.4674	+ 0.013	0.10	22.2	0.794	1.106	0.005	0.07	17 14
	22 17.9	.4701	+ .010	.10	20.5	.797	.106	.005	.07	17 15
	23 18.0	.4729	+ .004	.10	18.9	.801	.106	.005	.07	17 15
	24 18.1	.4756	— .003	.10	17.3	.804	.106	.005	.07	17 15
	25 18.1	.4783	— .008	.09	15.5	.808	.106	.004	.07	17 16
	26 18.2	0.4811	— 0.011	0.08	13.2	0.811	1.106	0.004	0.07	17 16
	27 18.3	.4838	— .011	.07	10.7	.815	.106	.004	.07	17 16
	28 18.3	.4866	— .008	.08	8.4	.818	.106	.004	.07	17 16
	29 18.4	.4893	— .002	.09	6.6	.822	.105	.005	.07	17 17
	30 18.5	.4920	+ .004	.10	5.0	.825	.105	.005	.07	17 17
July	1 18.5	0.4948	+ 0.009	0.10	3.6	0.829	1.105	0.005	0.07	17 17
	2 18.6	0.4975	+ 0.013	0.10	2.1	0.832	1.104	0.005	0.07	17 17

Date	<i>f</i>	<i>g</i>	log <i>g</i>	<i>G</i>	<i>h</i>	log <i>h</i>	<i>H</i>	<i>i</i>	log <i>i</i>	
July	1	+2.505	16.62	1.2205	23 17.1	20.44	1.3104	II 29.7	+1.17	0.068
	2	2.516	16.69	1.2224	23 17.3	20.43	1.3102	II 26.2	1.30	0.115
	3	2.527	16.76	1.2242	23 17.5	20.42	1.3100	II 22.7	1.44	0.157
	4	2.538	16.83	1.2260	23 17.7	20.41	1.3098	II 19.2	1.57	0.196
	5	2.549	16.90	1.2278	23 17.9	20.40	1.3096	II 15.7	1.70	0.231
	6	+2.560	16.97	1.2297	23 18.1	20.39	1.3094	II 12.1	+1.83	0.263
	7	2.571	17.04	1.2315	23 18.2	20.38	1.3091	II 08.6	1.97	0.293
	8	2.582	17.11	1.2333	23 18.4	20.36	1.3088	II 05.1	2.10	0.322
	9	2.593	17.18	1.2350	23 18.6	20.35	1.3085	II 01.5	2.23	0.348
	10	2.604	17.25	1.2368	23 18.7	20.33	1.3082	IO 58.0	2.36	0.373
	11	+2.615	17.32	1.2385	23 18.9	20.32	1.3079	IO 54.5	+2.49	0.396
	12	2.625	17.39	1.2402	23 19.0	20.30	1.3075	IO 50.9	2.62	0.418
	13	2.636	17.45	1.2419	23 19.1	20.29	1.3072	IO 47.3	2.74	0.438
	14	2.646	17.52	1.2436	23 19.2	20.27	1.3068	IO 43.7	2.87	0.458
	15	2.657	17.59	1.2454	23 19.3	20.25	1.3064	IO 40.2	3.00	0.477
	16	+2.667	17.66	1.2471	23 19.4	20.23	1.3060	IO 36.6	+3.12	0.495
	17	2.678	17.73	1.2487	23 19.5	20.21	1.3056	IO 33.0	3.25	0.512
	18	2.688	17.80	1.2504	23 19.6	20.19	1.3052	IO 29.4	3.37	0.528
	19	2.699	17.87	1.2521	23 19.7	20.17	1.3047	IO 25.8	3.49	0.543
	20	2.709	17.93	1.2537	23 19.7	20.15	1.3042	IO 22.2	3.62	0.558
	21	+2.719	18.00	1.2553	23 19.8	20.13	1.3038	IO 18.6	+3.74	0.573
	22	2.729	18.07	1.2569	23 19.9	20.10	1.3033	IO 14.9	3.86	0.586
	23	2.739	18.13	1.2585	23 19.9	20.08	1.3028	IO 11.3	3.98	0.600
	24	2.749	18.20	1.2600	23 19.9	20.05	1.3022	IO 07.7	4.10	0.612
	25	2.759	18.26	1.2616	23 20.0	20.03	1.3017	IO 04.0	4.21	0.624
	26	+2.769	18.33	1.2631	23 20.1	20.01	1.3012	IO 00.3	+4.33	0.6362
	27	2.779	18.39	1.2646	23 20.1	19.98	1.3006	9 56.7	4.44	0.6476
	28	2.788	18.45	1.2661	23 20.1	19.96	1.3001	9 53.0	4.56	0.6585
	29	2.798	18.51	1.2675	23 20.1	19.93	1.2995	9 49.3	4.67	0.6691
	30	2.807	18.58	1.2690	23 20.1	19.91	1.2990	9 45.6	4.78	0.6792
Aug.	31	+2.817	18.64	1.2705	23 20.2	19.88	1.2984	9 41.9	+4.89	0.6891
	1	2.826	18.71	1.2720	23 20.2	19.85	1.2978	9 38.1	5.00	0.6986
	2	2.836	18.77	1.2734	23 20.2	19.82	1.2972	9 34.4	5.10	0.7077
	3	2.845	18.83	1.2748	23 20.2	19.80	1.2966	9 30.7	5.21	0.7166
	4	2.854	18.89	1.2762	23 20.2	19.77	1.2960	9 26.9	5.31	0.7252
	5	+2.863	18.95	1.2775	23 20.2	19.74	1.2954	9 23.1	+5.41	0.7335
	6	2.872	19.01	1.2789	23 20.2	19.71	1.2947	9 19.3	5.51	0.7415
	7	2.881	19.06	1.2802	23 20.2	19.68	1.2941	9 15.5	5.61	0.7493
	8	2.889	19.12	1.2816	23 20.2	19.66	1.2935	9 11.7	5.71	0.7568
	9	2.898	19.18	1.2829	23 20.2	19.63	1.2929	9 07.9	5.81	0.7640
	10	+2.907	19.24	1.2842	23 20.2	19.60	1.2923	9 04.1	+5.90	0.7711
	11	2.915	19.29	1.2854	23 20.2	19.57	1.2916	9 00.3	6.00	0.7779
	12	2.924	19.35	1.2867	23 20.2	19.54	1.2910	8 56.4	6.09	0.7844
	13	2.932	19.40	1.2879	23 20.2	19.52	1.2904	8 52.5	6.18	0.7908
	14	2.940	19.46	1.2891	23 20.2	19.49	1.2898	8 48.6	6.27	0.7970
	15	+2.949	19.52	1.2904	23 20.2	19.46	1.2891	8 44.7	+6.35	0.8029
16	+2.957	19.57	1.2916	23 20.2	19.43	1.2885	8 40.8	+6.44	0.8087	

INDEPENDENT DAY NUMBERS, 1935

283

Date	Sidereal Time	τ	f'	g'	G'	$I + \pi$	$I + y$	$\frac{g'}{g_0}$	j	J
July	^h 18.5	0.4948	^s +0.009	^s 0.10	^h 3.6	0.829	1.105	0.005	0.07	^h 17 ^m 17
	18.6	.4975	+ .013	.10	2.1	.832	.104	.005	.07	17 17
	18.7	.5002	+ .015	.10	0.6	.836	.104	.005	.07	17 17
	18.7	.5030	+ .014	.09	23.0	.839	.103	.005	.07	17 18
	18.8	.5057	+ .010	.09	21.3	.843	.103	.004	.07	17 18
	18.9	0.5085	+0.005	0.09	19.6	0.846	1.102	0.004	0.07	17 18
	18.9	.5112	- .001	.09	17.9	.850	.101	.004	.07	17 18
	19.0	.5139	- .007	.09	16.2	.853	.101	.005	.07	17 18
	19.1	.5167	- .012	.10	14.6	.857	.100	.005	.08	17 19
	19.1	.5194	- .016	.11	13.1	.860	.099	.005	.08	17 19
	19.2	0.5221	-0.017	0.11	11.6	0.864	1.098	0.006	0.08	17 19
	19.3	.5249	- .016	.11	10.2	.867	.097	.006	.08	17 19
	19.3	.5276	- .011	.11	8.9	.870	.097	.005	.08	17 19
	19.4	.5304	- .005	.10	7.4	.874	.096	.005	.08	17 19
	19.5	.5331	+ .002	.09	5.6	.877	.095	.005	.08	17 19
	19.5	0.5358	+0.008	0.08	3.4	0.881	1.094	0.004	0.08	17 19
	19.6	.5386	+ .012	.08	1.0	.884	.093	.004	.08	17 20
	19.7	.5413	+ .013	.09	22.8	.888	.092	.005	.08	17 20
	19.7	.5440	+ .011	.10	21.1	.891	.091	.005	.08	17 20
	19.8	.5468	+ .006	.11	19.5	.894	.089	.005	.08	17 20
	19.9	0.5495	0.000	0.10	18.1	0.898	1.088	0.005	0.08	17 20
	19.9	.5523	- .006	.09	16.4	.901	.087	.004	.08	17 20
	20.0	.5550	- .009	.07	14.3	.904	.085	.004	.08	17 20
	20.1	.5577	- .010	.07	11.5	.907	.084	.003	.08	17 20
	20.1	.5605	- .008	.07	8.9	.911	.083	.004	.08	17 20
	20.2	0.5632	-0.003	0.09	7.0	0.914	1.082	0.004	0.08	17 20
	20.2	.5660	+ .003	.10	5.3	.917	.080	.005	.08	17 20
	20.3	.5687	+ .008	.10	3.9	.920	.079	.005	.08	17 20
	20.4	.5714	+ .013	.10	2.5	.923	.077	.005	.08	17 20
	20.4	.5742	+ .015	.10	1.1	.926	.076	.005	.08	17 20
Aug.	20.5	0.5769	+0.014	0.09	23.5	0.930	1.075	0.005	0.08	17 20
	20.6	.5796	+ .012	.09	21.9	.933	.073	.004	.08	17 20
	20.6	.5824	+ .007	.09	20.1	.936	.072	.004	.08	17 20
	20.7	.5851	+ .001	.09	18.4	.939	.070	.004	.08	17 20
	20.8	.5879	- .005	.09	16.7	.942	.069	.005	.08	17 20
	20.8	0.5906	-0.010	0.10	15.1	0.945	1.067	0.005	0.08	17 20
	20.9	.5933	- .015	.11	13.5	.948	.066	.005	.08	17 20
	21.0	.5961	- .017	.11	12.1	.951	.064	.006	.08	17 20
	21.0	.5988	- .017	.12	10.7	.954	.062	.006	.08	17 20
	21.1	.6015	- .014	.12	9.5	.957	.061	.006	.08	17 20
	21.2	0.6043	-0.009	0.11	8.1	0.959	1.060	0.005	0.08	17 20
	21.2	.6070	- .002	.10	6.5	.962	.058	.005	.08	17 20
	21.3	.6098	+ .005	.08	4.5	.965	.056	.004	.08	17 20
	21.4	.6125	+ .010	.07	1.9	.968	.055	.004	.08	17 20
	21.4	.6152	+ .012	.08	23.5	.970	.053	.004	.08	17 20
	21.5	0.6180	+0.011	0.09	21.5	0.973	1.052	0.005	0.09	17 20
	21.6	0.6207	+0.008	0.10	19.9	0.976	1.050	0.005	0.09	17 20

Date	<i>f</i>	<i>g</i>	log <i>g</i>	<i>G</i>	<i>h</i>	log <i>h</i>	<i>H</i>	<i>i</i>	log <i>i</i>
Aug. 16	+2.957	19.57	1.2916	^h 23 ^m 20.2	ⁿ 19.43	1.2885	^h 8 ^m 40.8	+6.44	0.8087
17	2.965	19.62	1.2927	23 20.1	19.40	1.2879	8 36.9	6.52	0.8142
18	2.973	19.67	1.2939	23 20.1	19.38	1.2873	8 33.0	6.60	0.8196
19	2.981	19.72	1.2950	23 20.1	19.35	1.2867	8 29.0	6.68	0.8248
20	2.988	19.78	1.2962	23 20.1	19.32	1.2861	8 25.1	6.76	0.8298
21	+2.996	19.83	1.2973	23 20.1	19.30	1.2855	8 21.1	+6.83	0.8346
22	3.004	19.88	1.2984	23 20.1	19.27	1.2849	8 17.1	6.91	0.8392
23	3.011	19.93	1.2995	23 20.1	19.24	1.2843	8 13.1	6.98	0.8437
24	3.019	19.98	1.3005	23 20.1	19.22	1.2837	8 09.1	7.05	0.8480
25	3.026	20.03	1.3016	23 20.1	19.20	1.2832	8 05.1	7.12	0.8522
26	+3.034	20.08	1.3027	23 20.2	19.17	1.2826	8 01.1	+7.18	0.8562
27	3.041	20.12	1.3037	23 20.2	19.15	1.2821	7 57.0	7.24	0.8600
28	3.048	20.17	1.3047	23 20.2	19.12	1.2815	7 52.9	7.31	0.8637
29	3.055	20.22	1.3057	23 20.2	19.10	1.2810	7 48.9	7.37	0.8672
30	3.062	20.26	1.3067	23 20.2	19.08	1.2805	7 44.8	7.42	0.8706
31	+3.069	20.31	1.3077	23 20.3	19.05	1.2800	7 40.7	+7.48	0.8738
Sept. 1	3.076	20.36	1.3087	23 20.3	19.03	1.2795	7 36.6	7.53	0.8769
2	3.083	20.40	1.3096	23 20.3	19.01	1.2790	7 32.5	7.58	0.8799
3	3.089	20.45	1.3106	23 20.3	18.99	1.2786	7 28.4	7.63	0.8827
4	3.096	20.49	1.3115	23 20.4	18.98	1.2782	7 24.3	7.68	0.8853
5	+3.103	20.53	1.3124	23 20.4	18.96	1.2778	7 20.1	+7.73	0.8879
6	3.109	20.57	1.3133	23 20.5	18.94	1.2774	7 16.0	7.77	0.8903
7	3.116	20.62	1.3142	23 20.5	18.92	1.2770	7 11.8	7.81	0.8925
8	3.123	20.66	1.3151	23 20.6	18.91	1.2766	7 07.7	7.85	0.8946
9	3.129	20.70	1.3159	23 20.7	18.89	1.2763	7 03.5	7.88	0.8966
10	+3.135	20.74	1.3168	23 20.7	18.88	1.2760	6 59.3	+7.92	0.8985
11	3.142	20.78	1.3177	23 20.8	18.87	1.2757	6 55.1	7.95	0.9002
12	3.148	20.82	1.3186	23 20.9	18.85	1.2754	6 50.9	7.98	0.9018
13	3.154	20.86	1.3194	23 20.9	18.84	1.2751	6 46.7	8.00	0.9032
14	3.160	20.90	1.3202	23 21.0	18.83	1.2749	6 42.4	8.03	0.9046
15	+3.166	20.94	1.3211	23 21.1	18.82	1.2746	6 38.2	+8.05	0.9058
16	3.173	20.98	1.3219	23 21.2	18.81	1.2744	6 33.9	8.07	0.9069
17	3.179	21.02	1.3227	23 21.3	18.81	1.2743	6 29.7	8.09	0.9078
18	3.185	21.06	1.3235	23 21.4	18.80	1.2741	6 25.5	8.10	0.9086
19	3.191	21.10	1.3243	23 21.5	18.79	1.2740	6 21.2	8.12	0.9093
20	+3.197	21.14	1.3251	23 21.7	18.79	1.2739	6 17.0	+8.13	0.9099
21	3.203	21.18	1.3259	23 21.8	18.78	1.2738	6 12.7	8.13	0.9103
22	3.210	21.21	1.3266	23 21.9	18.78	1.2737	6 08.5	8.14	0.9106
23	3.216	21.25	1.3273	23 22.1	18.78	1.2737	6 04.2	8.14	0.9108
24	3.222	21.29	1.3281	23 22.3	18.78	1.2737	5 59.9	8.15	0.9109
25	+3.228	21.33	1.3290	23 22.4	18.78	1.2737	5 55.7	+8.14	0.9108
26	3.234	21.37	1.3298	23 22.6	18.78	1.2737	5 51.4	8.14	0.9106
27	3.240	21.40	1.3305	23 22.7	18.78	1.2738	5 47.1	8.13	0.9103
28	3.246	21.44	1.3312	23 22.9	18.79	1.2739	5 42.8	8.13	0.9099
29	3.252	21.47	1.3319	23 23.1	18.79	1.2740	5 38.5	8.12	0.9093
30	+3.258	21.51	1.3326	23 23.3	18.80	1.2741	5 34.3	+8.10	0.9086
Oct. 1	+3.264	21.55	1.3334	23 23.5	18.81	1.2743	5 30.0	+8.09	0.9078

Date	Sidereal Time	τ	f'	g'	G'	$\tau + \pi$	$\tau + \gamma$	$\frac{g'}{g_0}$	j	J
Aug. 16	^h 21.6	0.6207	^s +0.008	^h 0.10	^h 19.9	0.976	1.050	0.005	0.09	^h 17 ^m 20
17	21.6	.6234	+ .002	.10	18.5	.978	.049	.005	.09	17 20
18	21.7	.6262	- .004	.09	16.9	.981	.048	.005	.09	17 20
19	21.8	.6289	- .008	.07	15.1	.984	.046	.004	.09	17 20
20	21.8	.6317	- .010	.06	12.3	.986	.045	.003	.09	17 20
21	21.9	0.6344	-0.008	0.07	9.5	0.989	1.043	0.003	0.09	17 20
22	22.0	.6371	- .004	.08	7.3	.991	.042	.004	.09	17 20
23	22.0	.6399	+ .002	.10	5.6	.994	.040	.005	.09	17 20
24	22.1	.6426	+ .007	.11	4.2	.996	.039	.005	.09	17 20
25	22.2	.6453	+ .012	.11	2.9	0.999	.038	.005	.09	17 20
26	22.2	0.6481	+0.015	0.11	1.5	1.001	1.036	0.005	0.09	17 20
27	22.3	.6508	+ .016	.10	23.9	.004	.035	.005	.09	17 20
28	22.4	.6536	+ .013	.10	22.5	.006	.034	.005	.09	17 20
29	22.4	.6563	+ .009	.09	20.7	.008	.032	.005	.09	17 20
30	22.5	.6590	+ .004	.09	19.0	.011	.031	.004	.09	17 20
31	22.5	0.6618	-0.002	0.09	17.3	1.013	1.030	0.004	0.09	17 20
Sept. 1	22.6	.6645	- .008	.09	15.7	.015	.029	.005	.09	17 20
2	22.7	.6673	- .013	.10	14.1	.017	.028	.005	.09	17 20
3	22.7	.6700	- .016	.11	12.5	.020	.027	.005	.09	17 20
4	22.8	.6727	- .017	.11	11.1	.022	.026	.006	.09	17 20
5	22.9	0.6755	-0.015	0.11	9.9	1.024	1.025	0.006	0.09	17 20
6	22.9	.6782	- .011	.11	8.5	.026	.024	.005	.09	17 20
7	23.0	.6809	- .005	.10	7.1	.028	.023	.005	.09	17 21
8	23.1	.6837	+ .002	.08	5.4	.030	.022	.004	.09	17 21
9	23.1	.6864	+ .007	.07	3.1	.032	.021	.003	.09	17 21
10	23.2	0.6892	+0.010	0.07	0.3	1.034	1.021	0.003	0.09	17 21
11	23.3	.6919	+ .011	.08	21.9	.036	.020	.004	.09	17 21
12	23.3	.6946	+ .008	.10	20.1	.039	.019	.005	.09	17 21
13	23.4	.6974	+ .003	.10	18.7	.040	.018	.005	.09	17 21
14	23.5	.7001	- .003	.10	17.2	.042	.018	.005	.09	17 21
15	23.5	0.7028	-0.008	0.08	15.5	1.045	1.017	0.004	0.09	17 21
16	23.6	.7056	- .010	.07	13.3	.047	.017	.003	.09	17 21
17	23.7	.7083	- .009	.07	10.5	.048	.017	.003	.09	17 21
18	23.7	.7111	- .006	.08	8.0	.050	.016	.004	.09	17 21
19	23.8	.7138	.000	.09	6.1	.052	.016	.005	.09	17 22
20	23.9	0.7165	+0.006	0.11	4.5	1.054	1.016	0.005	0.09	17 22
21	23.9	.7193	+ .012	.11	3.1	.056	.015	.006	.09	17 22
22	0.0	.7220	+ .015	.11	1.8	.058	.015	.005	.09	17 22
23	0.1	.7248	+ .016	.11	0.4	.060	.015	.005	.09	17 22
24	0.1	.7275	+ .015	.10	22.9	.062	.015	.005	.09	17 22
25	0.2	0.7302	+0.011	0.09	21.4	1.064	1.015	0.005	0.09	17 22
26	0.3	.7330	+ .006	.09	19.7	.066	.015	.005	.09	17 23
27	0.3	.7357	.000	.09	18.0	.067	.015	.004	.09	17 23
28	0.4	.7384	- .006	.09	16.3	.069	.016	.004	.09	17 23
29	0.5	.7412	- .011	.09	14.6	.071	.016	.005	.09	17 23
30	0.5	0.7439	-0.015	0.10	13.0	1.073	1.016	0.005	0.09	17 23
Oct. 1	0.6	0.7467	-0.016	0.11	11.5	1.075	1.017	0.005	0.09	17 23

Date	<i>f</i>	<i>g</i>	log <i>g</i>	<i>G</i>	<i>h</i>	log <i>h</i>	<i>H</i>	<i>i</i>	log <i>i</i>	
Oct.	1	+3.264	21.55	I.3334	23 23.5	18.81	I.2743	5 30.0	+8.09	0.9078
	2	3.271	21.59	I.3342	23 23.7	18.81	I.2745	5 25.7	8.07	0.9068
	3	3.277	21.63	I.3350	23 23.9	18.82	I.2746	5 21.5	8.05	0.9057
	4	3.283	21.67	I.3358	23 24.1	18.83	I.2748	5 17.2	8.03	0.9045
	5	3.289	21.71	I.3366	23 24.3	18.84	I.2751	5 12.9	8.00	0.9031
	6	+3.295	21.74	I.3373	23 24.5	18.85	I.2754	5 08.6	+7.97	0.9016
	7	3.302	21.78	I.3380	23 24.8	18.87	I.2757	5 04.4	7.94	0.9000
	8	3.308	21.82	I.3388	23 25.0	18.88	I.2760	5 00.1	7.91	0.8982
	9	3.314	21.85	I.3395	23 25.3	18.89	I.2763	4 55.9	7.88	0.8963
	10	3.320	21.89	I.3403	23 25.5	18.91	I.2767	4 51.6	7.84	0.8943
	11	+3.327	21.93	I.3411	23 25.7	18.93	I.2771	4 47.3	+7.80	0.8921
	12	3.334	21.97	I.3419	23 26.0	18.95	I.2775	4 43.1	7.76	0.8897
	13	3.340	22.01	I.3427	23 26.3	18.96	I.2779	4 38.9	7.71	0.8873
	14	3.347	22.05	I.3434	23 26.5	18.98	I.2783	4 34.7	7.67	0.8847
	15	3.354	22.09	I.3442	23 26.8	19.00	I.2787	4 30.4	7.62	0.8819
	16	+3.360	22.13	I.3450	23 27.1	19.02	I.2792	4 26.2	+7.57	0.8790
	17	3.367	22.17	I.3458	23 27.4	19.04	I.2797	4 22.0	7.51	0.8759
	18	3.374	22.21	I.3466	23 27.7	19.06	I.2802	4 17.8	7.46	0.8727
	19	3.381	22.26	I.3475	23 27.9	19.09	I.2807	4 13.6	7.40	0.8693
	20	3.388	22.30	I.3483	23 28.2	19.11	I.2812	4 09.4	7.34	0.8658
	21	+3.395	22.34	I.3491	23 28.5	19.13	I.2818	4 05.2	+7.28	0.8621
	22	3.402	22.38	I.3499	23 28.9	19.16	I.2823	4 01.1	7.21	0.8582
	23	3.410	22.43	I.3508	23 29.2	19.18	I.2829	3 56.9	7.15	0.8542
	24	3.417	22.48	I.3517	23 29.5	19.21	I.2835	3 52.7	7.08	0.8499
	25	3.424	22.52	I.3525	23 29.8	19.24	I.2841	3 48.6	7.01	0.8456
	26	+3.432	22.56	I.3533	23 30.1	19.26	I.2847	3 44.5	+6.93	0.8410
	27	3.439	22.60	I.3542	23 30.4	19.29	I.2853	3 40.3	6.86	0.8362
	28	3.447	22.65	I.3551	23 30.7	19.32	I.2859	3 36.2	6.78	0.8313
	29	3.455	22.70	I.3561	23 31.1	19.34	I.2865	3 32.1	6.70	0.8262
	30	3.462	22.75	I.3570	23 31.4	19.37	I.2871	3 28.0	6.62	0.8208
Nov.	31	+3.470	22.79	I.3578	23 31.7	19.40	I.2878	3 23.9	+6.54	0.8153
	1	3.478	22.84	I.3587	23 32.1	19.43	I.2884	3 19.8	6.45	0.8096
	2	3.486	22.89	I.3597	23 32.4	19.46	I.2891	3 15.7	6.36	0.8036
	3	3.494	22.94	I.3607	23 32.7	19.49	I.2898	3 11.7	6.27	0.7974
	4	3.503	22.99	I.3616	23 33.1	19.52	I.2904	3 07.7	6.18	0.7910
	5	+3.511	23.04	I.3625	23 33.4	19.54	I.2910	3 03.6	+6.09	0.7844
	6	3.520	23.09	I.3635	23 33.7	19.57	I.2917	2 59.5	5.99	0.7775
	7	3.529	23.15	I.3645	23 34.1	19.60	I.2923	2 55.5	5.89	0.7704
	8	3.538	23.20	I.3655	23 34.4	19.63	I.2930	2 51.5	5.79	0.7630
	9	3.546	23.25	I.3665	23 34.7	19.66	I.2936	2 47.5	5.69	0.7554
	10	+3.555	23.31	I.3676	23 35.1	19.69	I.2943	2 43.5	+5.59	0.7474
	11	3.564	23.37	I.3686	23 35.4	19.72	I.2949	2 39.5	5.49	0.7392
	12	3.573	23.42	I.3696	23 35.7	19.75	I.2956	2 35.6	5.38	0.7307
	13	3.582	23.47	I.3706	23 36.0	19.78	I.2962	2 31.6	5.27	0.7219
	14	3.591	23.53	I.3717	23 36.3	19.81	I.2969	2 27.7	5.16	0.7127
	15	+3.600	23.59	I.3728	23 36.7	19.84	I.2975	2 23.7	+5.05	0.7032
16	+3.610	23.65	I.3739	23 37.0	19.87	I.2981	2 19.8	+4.94	0.6934	

Date	Sidereal Time	τ	f'	g'	G'	$I + x$	$I + y$	$\frac{g'}{g_0}$	j	J
Oct. 1	^h 0.6	0.7467	^s -0.016	["] 0.11	^h 11.5	I.075	I.017	0.005	0.09	^h ^m 17 23
2	0.7	.7494	- .015	.11	10.2	.077	.017	.005	.09	17 24
3	0.7	.7521	- .012	.11	8.9	.079	.017	.005	.09	17 24
4	0.8	.7549	- .006	.10	7.4	.081	.018	.005	.09	17 24
5	0.8	.7576	.000	.09	6.0	.083	.018	.004	.09	17 24
6	0.9	0.7603	+0.006	0.07	3.9	I.084	I.019	0.004	0.09	17 25
7	1.0	.7631	+ .009	.06	1.3	.086	.020	.003	.10	17 25
8	1.0	.7658	+ .010	.07	22.5	.088	.020	.004	.10	17 25
9	1.1	.7686	+ .008	.09	20.5	.090	.021	.004	.10	17 25
10	1.2	.7713	+ .003	.10	18.8	.092	.022	.005	.10	17 25
11	1.2	0.7740	-0.003	0.10	17.4	I.094	I.023	0.005	0.10	17 26
12	1.3	.7768	- .008	.09	15.8	.096	.024	.005	.10	17 26
13	1.4	.7795	- .011	.08	13.8	.098	.025	.004	.10	17 26
14	1.4	.7822	- .011	.07	11.3	.100	.026	.004	.10	17 27
15	1.5	.7850	- .008	.08	8.9	.102	.027	.004	.10	17 27
16	1.6	0.7877	-0.003	0.09	6.8	I.104	I.028	0.004	0.10	17 27
17	1.6	.7905	+ .004	.10	5.1	.106	.029	.005	.10	17 27
18	1.7	.7932	+ .010	.11	3.6	.108	.030	.005	.10	17 28
19	1.8	.7959	+ .014	.11	2.2	.110	.032	.006	.10	17 28
20	1.8	.7987	+ .017	.11	0.8	.112	.033	.005	.10	17 28
21	1.9	0.8014	+0.016	0.11	23.4	I.114	I.034	0.005	0.10	17 29
22	2.0	.8042	+ .013	.10	21.9	.116	.035	.005	.10	17 29
23	2.0	.8069	+ .008	.09	20.3	.119	.037	.005	.10	17 29
24	2.1	.8096	+ .002	.09	18.7	.121	.038	.004	.10	17 29
25	2.2	.8124	- .004	.09	16.9	.123	.040	.004	.10	17 30
26	2.2	0.8151	-0.009	0.09	15.2	I.125	I.041	0.004	0.10	17 30
27	2.3	.8178	- .013	.09	13.5	.127	.043	.005	.10	17 30
28	2.4	.8206	- .015	.10	12.0	.130	.044	.005	.10	17 31
29	2.4	.8233	- .015	.10	10.6	.132	.046	.005	.10	17 31
30	2.5	.8261	- .012	.10	9.1	.135	.047	.005	.10	17 31
31	2.6	0.8288	-0.007	0.10	7.8	I.137	I.049	0.005	0.10	17 32
Nov. 1	2.6	.8315	- .001	.09	6.3	.139	.050	.005	.10	17 32
2	2.7	.8343	+ .005	.08	4.5	.142	.052	.004	.10	17 32
3	2.8	.8370	+ .009	.07	2.1	.144	.053	.003	.10	17 33
4	2.8	.8397	+ .011	.07	23.4	.147	.055	.003	.10	17 33
5	2.9	0.8425	+0.009	0.08	21.1	I.149	I.056	0.004	0.10	17 33
6	3.0	.8452	+ .005	.09	19.3	.152	.058	.005	.10	17 34
7	3.0	.8480	- .001	.10	17.8	.154	.060	.005	.10	17 34
8	3.1	.8507	- .007	.10	16.2	.157	.061	.005	.10	17 34
9	3.1	.8534	- .011	.09	14.4	.160	.063	.004	.10	17 35
10	3.2	0.8562	-0.012	0.08	12.3	I.163	I.064	0.004	0.10	17 35
11	3.3	.8589	- .010	.08	9.9	.165	.066	.004	.10	17 35
12	3.3	.8616	- .006	.09	7.7	.168	.068	.004	.10	17 36
13	3.4	.8644	+ .001	.10	5.8	.171	.069	.005	.10	17 36
14	3.5	.8671	+ .008	.11	4.2	.174	.071	.005	.10	17 36
15	3.5	0.8699	+0.013	0.11	2.7	I.177	I.072	0.006	0.10	17 37
16	3.6	0.8726	+0.016	0.11	1.3	I.180	I.074	0.006	0.10	17 37

INDEPENDENT DAY NUMBERS, 1935

Date	<i>f</i>	<i>g</i>	log <i>g</i>	<i>G</i>	<i>h</i>	log <i>h</i>	<i>H</i>	<i>i</i>	log <i>i</i>
Nov. 16	+3.610	23.65	1.3739	23 37.0	19.87	1.2981	2 19.8	+4.94	0.693
17	3.619	23.71	1.3749	23 37.3	19.89	1.2987	2 15.9	4.82	0.683
18	3.629	23.77	1.3760	23 37.6	19.92	1.2993	2 12.0	4.71	0.672
19	3.639	23.83	1.3771	23 37.9	19.95	1.2999	2 08.1	4.59	0.661
20	3.649	23.89	1.3783	23 38.3	19.98	1.3005	2 04.2	4.47	0.650
21	+3.658	23.96	1.3794	23 38.6	20.00	1.3011	2 00.3	+4.35	0.638
22	3.668	24.02	1.3805	23 38.9	20.03	1.3017	1 56.4	4.23	0.626
23	3.679	24.08	1.3817	23 39.2	20.05	1.3022	1 52.5	4.10	0.613
24	3.689	24.14	1.3828	23 39.5	20.08	1.3028	1 48.7	3.98	0.600
25	3.699	24.21	1.3840	23 39.8	20.10	1.3033	1 44.8	3.85	0.586
26	+3.709	24.28	1.3852	23 40.1	20.13	1.3038	1 41.0	+3.72	0.571
27	3.720	24.34	1.3863	23 40.3	20.15	1.3043	1 37.1	3.60	0.556
28	3.730	24.41	1.3875	23 40.6	20.17	1.3048	1 33.3	3.47	0.540
29	3.741	24.47	1.3887	23 40.9	20.20	1.3053	1 29.5	3.33	0.523
30	3.751	24.54	1.3899	23 41.1	20.22	1.3057	1 25.7	3.20	0.505
Dec. 1	+3.762	24.61	1.3911	23 41.4	20.24	1.3062	1 21.9	+3.07	0.487
2	3.773	24.68	1.3923	23 41.7	20.26	1.3066	1 18.1	2.93	0.467
3	3.784	24.75	1.3935	23 41.9	20.28	1.3070	1 14.3	2.80	0.447
4	3.795	24.81	1.3947	23 42.1	20.30	1.3074	1 10.5	2.67	0.426
5	3.806	24.88	1.3959	23 42.4	20.31	1.3078	1 06.7	2.53	0.403
6	+3.817	24.96	1.3972	23 42.6	20.33	1.3081	1 02.9	+2.39	0.379
7	3.828	25.03	1.3984	23 42.9	20.35	1.3085	0 59.1	2.25	0.353
8	3.839	25.10	1.3996	23 43.1	20.36	1.3088	0 55.4	2.11	0.325
9	3.850	25.17	1.4009	23 43.3	20.38	1.3091	0 51.6	1.97	0.295
10	3.861	25.24	1.4021	23 43.5	20.39	1.3094	0 47.9	1.83	0.263
11	+3.873	25.31	1.4033	23 43.7	20.40	1.3096	0 44.1	+1.69	0.228
12	3.885	25.39	1.4046	23 43.9	20.41	1.3099	0 40.3	1.55	0.190
13	3.896	25.46	1.4059	23 44.1	20.42	1.3101	0 36.6	1.41	0.149
14	3.907	25.53	1.4071	23 44.3	20.43	1.3103	0 32.9	1.27	0.102
15	3.919	25.60	1.4083	23 44.4	20.44	1.3105	0 29.1	1.12	0.050
16	+3.930	25.68	1.4096	23 44.6	20.45	1.3106	0 25.3	+0.98	9.991
17	3.942	25.75	1.4108	23 44.7	20.46	1.3108	0 21.6	0.84	9.922
18	3.953	25.82	1.4120	23 44.9	20.46	1.3109	0 17.9	0.69	9.839
19	3.965	25.90	1.4133	23 45.0	20.46	1.3110	0 14.1	0.55	9.738
20	3.976	25.98	1.4146	23 45.2	20.46	1.3110	0 10.4	0.40	9.604
21	+3.988	26.05	1.4158	23 45.3	20.47	1.3111	0 06.7	+0.26	9.411
22	3.999	26.13	1.4171	23 45.4	20.47	1.3111	0 02.9	+0.11	9.052
23	4.011	26.21	1.4184	23 45.5	20.47	1.3111	23 59.2	-0.03	8.505 _n
24	4.022	26.28	1.4196	23 45.7	20.47	1.3111	23 55.5	0.18	9.247 _n
25	4.034	26.35	1.4208	23 45.8	20.47	1.3111	23 51.7	0.32	9.507 _n
26	+4.046	26.42	1.4220	23 45.9	20.46	1.3110	23 48.0	-0.47	9.668 _n
27	4.057	26.50	1.4232	23 45.9	20.46	1.3109	23 44.2	0.61	9.786 _n
28	4.069	26.58	1.4245	23 46.0	20.46	1.3108	23 40.5	0.75	9.878 _n
29	4.080	26.65	1.4257	23 46.1	20.45	1.3107	23 36.7	0.90	9.954 _n
30	4.092	26.72	1.4269	23 46.2	20.45	1.3106	23 33.0	1.04	0.018 _n
31	+4.103	26.80	1.4281	23 46.3	20.44	1.3104	23 29.3	-1.19	0.074 _n
32	+4.115	26.88	1.4294	23 46.3	20.43	1.3102	23 25.5	-1.33	0.124 _n

Date	Sidereal Time	τ	f'	g'	G'	$I + x$	$I + y$	$\frac{g'}{g_0}$	j	J
Nov. 16	^h 3.6	0.8726	^h +0.016	^m 0.11	^h 1.3	1.180	1.074	0.006	0.10	^h 17 ^m 37
17	3.7	.8753	+ .016	.11	23.8	.182	.075	.005	.10	17 37
18	3.7	.8781	+ .014	.10	22.3	.185	.077	.005	.10	17 38
19	3.8	.8808	+ .010	.10	20.8	.188	.078	.005	.10	17 38
20	3.9	.8836	+ .004	.09	19.2	.192	.080	.005	.10	17 38
21	3.9	0.8863	-0.002	0.09	17.5	1.195	1.081	0.004	0.10	17 39
22	4.0	.8890	- .007	.09	15.7	.198	.083	.004	.10	17 39
23	4.1	.8918	- .012	.09	14.0	.201	.084	.004	.11	17 39
24	4.1	.8945	- .015	.10	12.5	.204	.085	.005	.11	17 39
25	4.2	.8972	- .015	.10	10.9	.207	.087	.005	.11	17 40
26	4.3	0.9000	-0.013	0.10	9.5	1.211	1.088	0.005	0.11	17 40
27	4.3	.9027	- .008	.10	8.2	.214	.089	.005	.11	17 40
28	4.4	.9055	- .003	.09	6.7	.217	.091	.005	.11	17 41
29	4.5	.9082	+ .004	.08	4.9	.221	.092	.004	.11	17 41
30	4.5	.9109	+ .008	.07	2.7	.224	.093	.004	.11	17 41
Dec. 1	4.6	0.9137	+0.011	0.07	0.2	1.227	1.094	0.004	0.11	17 41
2	4.7	.9164	+ .011	.08	21.9	.231	.095	.004	.11	17 42
3	4.7	.9191	+ .007	.09	20.1	.234	.096	.005	.11	17 42
4	4.8	.9219	+ .002	.10	18.4	.237	.097	.005	.11	17 42
5	4.9	.9246	- .005	.10	16.8	.241	.098	.005	.11	17 42
6	4.9	0.9274	-0.010	0.09	15.1	1.245	1.099	0.005	0.11	17 43
7	5.0	.9301	- .012	.08	13.1	.248	.100	.004	.11	17 43
8	5.1	.9328	- .012	.08	10.7	.252	.101	.004	.11	17 43
9	5.1	.9356	- .008	.09	8.5	.255	.101	.004	.11	17 43
10	5.2	.9383	- .002	.09	6.6	.259	.102	.005	.11	17 43
11	5.3	0.9410	+0.005	0.10	4.9	1.262	1.103	0.005	0.11	17 44
12	5.3	.9438	+ .011	.11	3.3	.266	.103	.005	.11	17 44
13	5.4	.9465	+ .015	.11	1.8	.270	.104	.005	.11	17 44
14	5.4	.9493	+ .016	.11	0.3	.273	.104	.005	.11	17 44
15	5.5	.9520	+ .015	.10	22.7	.277	.105	.005	.11	17 44
16	5.6	0.9547	+0.011	0.10	21.2	1.281	1.105	0.005	0.11	17 45
17	5.6	.9575	+ .006	.09	19.7	.284	.106	.005	.11	17 45
18	5.7	.9602	.000	.09	17.9	.288	.106	.004	.11	17 45
19	5.8	.9629	- .006	.09	16.2	.292	.106	.004	.11	17 45
20	5.8	.9657	- .011	.09	14.5	.296	.106	.004	.11	17 45
21	5.9	0.9684	-0.014	0.09	12.9	1.299	1.106	0.005	0.11	17 45
22	6.0	.9712	- .015	.10	11.4	.303	.106	.005	.11	17 45
23	6.0	.9739	- .014	.10	10.0	.307	.106	.005	.11	17 46
24	6.1	.9766	- .010	.10	8.6	.310	.106	.005	.11	17 46
25	6.2	.9794	- .004	.10	7.2	.314	.106	.005	.12	17 46
26	6.2	0.9821	+0.002	0.09	5.5	1.318	1.106	0.004	0.12	17 46
27	6.3	.9849	+ .007	.08	3.4	.321	.106	.004	.12	17 46
28	6.4	.9876	+ .011	.07	1.0	.325	.105	.004	.12	17 46
29	6.4	.9903	+ .012	.08	22.7	.329	.105	.004	.12	17 46
30	6.5	.9931	+ .009	.09	20.7	.333	.105	.004	.12	17 46
31	6.6	0.9958	+0.004	0.10	19.1	1.336	1.104	0.005	0.12	17 46
32	6.6	0.9985	-0.002	0.10	17.6	1.340	1.104	0.005	0.12	17 46

DIFFERENTIAL ABERRATION

THE FUNCTION $F(a)$ IN UNITS OF THE SECOND DECIMALFor values of a or $(a + 6^h)$ at the foot of the table, the signs must be reversed.

Date	^h 0.0	^h 0.5	^h 1.0	^h 1.5	^h 2.0	^h 2.5	^h 3.0	^h 3.5	^h 4.0	^h 4.5	^h 5.0	^h 5.5	^h 6.0
Jan. 1	-9	-9	-9	-9	-8	-8	-7	-6	-6	-5	-4	-2	-1
6	9	9	9	9	8	8	8	7	6	5	4	3	2
11	8	9	9	9	9	8	8	7	7	6	5	4	3
16	8	8	9	9	9	8	8	8	7	6	5	4	3
21	8	8	9	9	9	9	8	8	7	7	6	5	4
26	-7	-8	-8	-8	-9	-9	-8	-8	-8	-7	-6	-6	-5
31	7	7	8	8	8	9	8	8	8	7	7	6	5
Feb. 5	6	7	8	8	8	8	8	8	8	8	7	6	6
10	6	6	7	8	8	8	8	8	8	8	8	7	6
15	5	6	7	8	8	8	8	8	8	8	8	7	7
20	-4	-5	-6	-7	-7	-8	-8	-8	-8	-8	-8	-8	-7
25	4	5	5	6	7	7	8	8	8	8	8	8	7
Mar. 2	3	4	5	6	6	7	8	8	8	8	8	8	8
7	2	3	4	5	6	7	8	8	8	8	8	8	8
12	1	3	3	4	5	6	7	8	8	8	8	8	8
17	-1	-2	-3	-4	-5	-6	-6	-7	-7	-8	-8	-8	-8
22	0	-1	2	3	4	5	6	6	7	8	8	8	8
27	+1	0	-1	2	3	4	5	6	7	7	8	8	8
Apr. 1	2	0	0	2	3	4	5	5	6	7	7	8	8
6	2	+1	0	-1	2	3	4	5	6	6	7	7	8
11	+3	+2	+1	+0	-1	-2	-3	-4	-5	-6	-7	-7	-8
16	4	3	2	1	0	1	2	4	4	5	6	7	7
21	4	3	2	1	0	-1	2	3	4	5	6	6	7
26	5	4	3	2	+1	0	-1	2	3	4	5	6	7
May 1	6	5	4	3	2	+1	0	1	2	4	5	5	6
6	+6	+5	+5	+4	+3	+1	+0	-1	-2	-3	-4	-5	-6
11	7	6	5	4	3	2	1	0	1	2	3	4	5
16	7	7	6	5	4	3	2	+1	-1	2	3	4	5
21	8	7	6	5	5	3	2	1	0	-1	2	3	4
26	8	7	7	6	5	4	3	2	+1	0	1	3	4
31	+8	+8	+7	+7	+6	+5	+4	+3	+2	+0	-1	-2	-3
June 5	8	8	8	7	6	5	4	3	2	1	0	-1	2
10	9	8	8	7	7	6	5	4	3	2	+1	0	2
15	9	9	8	8	7	6	5	4	3	2	1	0	-1
20	9	9	8	8	8	7	6	5	4	3	2	+1	0
25	+9	+9	+9	+8	+8	+7	+6	+6	+5	+4	+3	+1	0
30	+9	+9	+9	+9	+8	+8	+7	+6	+5	+4	+3	+2	+1
	^h 12.0	^h 12.5	^h 13.0	^h 13.5	^h 14.0	^h 14.5	^h 15.0	^h 15.5	^h 16.0	^h 16.5	^h 17.0	^h 17.5	^h 18.0

$$\text{Differential aberration in R.A.} = F(a) \frac{\sec \delta}{15} \Delta a - F(a + 6^h) \frac{\sec \delta \tan \delta}{225} \Delta \delta$$

$$\text{Differential aberration in Dec.} = F(a + 6^h) \sin \delta \Delta a + F(a) \frac{\cos \delta}{15} \Delta \delta$$

where Δa and $\Delta \delta$ are in units of r^m and r' respectively, in the sense moving object *minus* star. The functions of δ required are tabulated on page 294.

DIFFERENTIAL ABERRATION

291

THE FUNCTION $F(\alpha)$ IN UNITS OF THE SECOND DECIMAL

For values of α or $(\alpha + 6^h)$ at the foot of the table, the signs must be reversed.

Date	^h 6.0	^h 6.5	^h 7.0	^h 7.5	^h 8.0	^h 8.5	^h 9.0	^h 9.5	^h 10.0	^h 10.5	^h 11.0	^h 11.5	^h 12.0
Jan. 1	-1	-0	+1	+2	+3	+4	+5	+6	+7	+8	+8	+8	+9
6	2	1	0	1	2	4	5	6	6	7	8	8	9
11	3	2	0	+1	2	3	4	5	6	7	7	8	8
16	3	2	-1	0	+1	2	3	4	5	6	7	7	8
21	4	3	2	-1	0	1	3	4	5	5	6	7	8
26	-5	-4	-3	-2	-0	+1	+2	+3	+4	+5	+6	+7	+7
31	5	4	3	2	1	0	+1	2	3	4	5	6	7
Feb. 5	6	5	4	3	2	-1	0	1	2	4	5	5	6
10	6	5	5	4	2	1	0	+1	2	3	4	5	6
15	7	6	5	4	3	2	-1	0	+1	2	3	4	5
20	-7	-6	-6	-5	-4	-3	-2	-1	-0	+1	+2	+3	+4
25	7	7	6	5	5	4	3	2	0	0	2	3	4
Mar. 2	8	7	7	6	5	4	3	2	1	0	+1	2	3
7	8	8	7	6	6	5	4	3	2	-1	0	+1	2
12	8	8	7	7	6	5	5	4	3	2	-1	0	1
17	-8	-8	-8	-7	-7	-6	-5	-4	-3	-2	-1	-0	+1
22	8	8	8	8	7	7	6	5	4	3	2	1	0
27	8	8	8	8	7	7	6	6	5	4	3	2	-1
Apr. 1	8	8	8	8	8	7	7	6	5	5	4	3	2
6	8	8	8	8	8	8	7	7	6	5	4	3	2
11	-8	-8	-8	-8	-8	-8	-8	-7	-6	-6	-5	-4	-3
16	7	8	8	8	8	8	8	7	7	6	6	5	4
21	7	8	8	8	8	8	8	8	7	7	6	5	4
26	7	7	8	8	8	8	8	8	8	7	7	6	5
May 1	6	7	8	8	8	8	8	8	8	8	7	6	5
6	-6	-7	-7	-8	-8	-8	-8	-9	-8	-8	-8	-7	-6
11	5	6	7	7	8	8	9	9	9	8	8	7	7
16	5	6	6	7	8	8	8	9	9	8	8	8	7
21	4	5	6	7	7	8	8	9	9	9	8	8	8
26	4	5	6	6	7	8	8	9	9	9	9	8	8
31	-3	-4	-5	-6	-7	-7	-8	-8	-9	-9	-9	-9	-8
June 5	2	3	4	5	6	7	8	8	9	9	9	9	8
10	2	3	4	5	6	7	8	8	9	9	9	9	9
15	-1	2	3	4	5	6	7	8	8	9	9	9	9
20	0	1	3	4	5	6	6	7	8	8	9	9	9
25	+0	-1	-2	-3	-4	-5	-6	-7	-7	-8	-8	-9	-9
30	+1	0	-1	-2	-3	-5	-6	-6	-7	-8	-8	-9	-9
	^h 18.0	^h 18.5	^h 19.0	^h 19.5	^h 20.0	^h 20.5	^h 21.0	^h 21.5	^h 22.0	^h 22.5	^h 23.0	^h 23.5	^h 24.0

This table should be used without interpolation, using the date nearest to the date of observation, and the value of α nearest to the right ascension of the star.

The maximum value of the differential aberration for two objects separated by 1° is of the order $0^s.02 \sec \delta$ in right ascension, or $0''.3$ in declination.

DIFFERENTIAL ABERRATION

THE FUNCTION $F(a)$ IN UNITS OF THE SECOND DECIMALFor values of a or $(a + 6^h)$ at the foot of the table, the signs must be reversed.

Date	^h 0.0	^h 0.5	^h 1.0	^h 1.5	^h 2.0	^h 2.5	^h 3.0	^h 3.5	^h 4.0	^h 4.5	^h 5.0	^h 5.5	^h 6.0
July 5	+9	+9	+9	+9	+8	+8	+7	+7	+6	+5	+4	+3	+2
10	8	9	9	9	9	8	8	7	6	5	4	3	2
15	8	9	9	9	9	8	8	7	7	6	5	4	3
20	8	8	9	9	9	8	8	8	7	6	6	5	4
25	8	8	8	9	9	9	8	8	7	7	6	5	4
30	+7	+8	+8	+8	+9	+9	+9	+8	+8	+7	+6	+6	+5
Aug. 4	7	7	8	8	9	9	9	8	8	7	7	6	5
9	6	7	8	8	8	9	8	8	8	8	7	7	6
14	6	6	7	8	8	8	8	8	8	8	8	7	6
19	5	6	7	7	8	8	8	8	8	8	8	7	7
24	+4	+5	+6	+7	+7	+8	+8	+8	+8	+8	+8	+8	+7
29	4	5	6	6	7	7	8	8	8	8	8	8	7
Sept. 3	3	4	5	6	6	7	8	8	8	8	8	8	8
8	2	3	4	5	6	7	7	8	8	8	8	8	8
13	2	3	4	5	5	6	7	7	8	8	8	8	8
18	+1	+2	+3	+4	+5	+6	+6	+7	+8	+8	+8	+8	+8
23	0	+1	2	3	4	5	6	7	7	8	8	8	8
28	-1	0	1	2	4	4	5	6	7	7	8	8	8
Oct. 3	1	0	+1	2	3	4	5	6	6	7	7	8	8
8	2	-1	0	+1	2	3	4	5	6	6	7	8	8
13	-3	-2	-1	-0	+1	+2	+3	+4	+5	+6	+7	+7	+8
18	4	2	2	0	+1	2	3	4	5	5	6	7	7
23	4	3	2	1	0	+1	2	3	4	5	6	7	7
28	5	4	3	2	-1	0	1	2	3	4	5	6	7
Nov. 2	6	5	4	3	2	0	+1	2	3	4	5	6	6
7	-6	-5	-4	-3	-2	-1	-0	+1	+2	+3	+4	+5	+6
12	7	6	5	4	3	2	1	0	1	2	3	4	5
17	7	6	6	5	4	3	2	-1	+1	2	3	4	5
22	8	7	6	5	4	3	2	1	0	+1	2	3	4
27	8	7	7	6	5	4	3	2	-1	0	1	3	4
Dec. 2	-8	-8	-7	-7	-6	-5	-4	-3	-2	-0	+1	+2	+3
7	9	8	8	7	6	5	4	3	2	1	0	+1	2
12	9	8	8	7	7	6	5	4	3	2	-1	0	2
17	9	9	8	8	7	7	6	5	4	3	1	0	+1
22	9	9	9	8	8	7	6	5	4	3	2	-1	0
27	-9	-9	-9	-8	-8	-7	-7	-6	-5	-4	-3	-2	-1
32	-9	-9	-9	-9	-8	-8	-7	-6	-6	-5	-4	-2	-1
	^h 12.0	^h 12.5	^h 13.0	^h 13.5	^h 14.0	^h 14.5	^h 15.0	^h 15.5	^h 16.0	^h 16.5	^h 17.0	^h 17.5	^h 18.0

$$\text{Differential aberration in R.A.} = F(a) \frac{\sec \delta}{15} \Delta a - F(a + 6^h) \frac{\sec \delta \tan \delta}{225} \Delta \delta$$

$$\text{Differential aberration in Dec.} = F(a + 6^h) \sin \delta \Delta a + F(a) \frac{\cos \delta}{15} \Delta \delta$$

where Δa and $\Delta \delta$ are in units of 1^m and $1'$ respectively, in the sense moving object *minus* star. The functions of δ required are tabulated on page 294.

DIFFERENTIAL ABERRATION

293

THE FUNCTION $F(\alpha)$ IN UNITS OF THE SECOND DECIMAL

For values of α or $(\alpha + 6^h)$ at the foot of the table, the signs must be reversed.

Date	^h 6·0	^h 6·5	^h 7·0	^h 7·5	^h 8·0	^h 8·5	^h 9·0	^h 9·5	^h 10·0	^h 10·5	^h 11·0	^h 11·5	^h 12·0
July 5	+2	+1	-1	-2	-3	-4	-5	-6	-7	-7	-8	-8	-9
10	2	1	0	-1	2	3	4	5	6	7	8	8	8
15	3	2	+1	0	1	3	4	5	6	6	7	8	8
20	4	3	1	0	-1	2	3	4	5	6	7	7	8
25	4	3	2	+1	0	1	2	3	4	5	6	7	8
30	+5	+4	+3	+2	+1	-1	-2	-3	-4	-5	-6	-7	-7
Aug. 4	5	4	3	2	1	0	-1	2	3	4	5	6	7
9	6	5	4	3	2	+1	0	1	2	4	5	5	6
14	6	5	5	4	2	1	0	-1	2	3	4	5	6
19	7	6	5	4	3	2	+1	0	-1	2	3	4	5
24	+7	+6	+6	+5	+4	+3	+2	+1	+0	-1	-2	-3	-4
29	7	7	6	5	4	4	2	1	0	-1	2	3	4
Sept. 3	8	7	7	6	5	4	3	2	1	0	-1	2	3
8	8	7	7	6	6	5	4	3	2	+1	0	1	2
13	8	8	7	7	6	5	4	4	3	2	0	-1	2
18	+8	+8	+8	+7	+7	+6	+5	+4	+3	+2	+1	+0	-1
23	8	8	8	7	7	6	6	5	4	3	2	1	0
28	8	8	8	8	7	6	6	5	4	3	2	2	+1
Oct. 3	8	8	8	8	8	7	7	6	5	4	3	2	1
8	8	8	8	8	8	8	7	6	6	5	4	3	2
13	+8	+8	+8	+8	+8	+8	+7	+7	+6	+6	+5	+4	+3
18	7	8	8	8	8	8	8	7	7	6	5	4	4
23	7	8	8	8	8	8	8	8	7	7	6	5	4
28	7	7	8	8	8	8	8	8	8	7	7	6	5
Nov. 2	6	7	8	8	8	8	8	8	8	8	7	6	6
7	+6	+7	+7	+8	+8	+8	+8	+8	+8	+8	+7	+7	+6
12	5	6	7	8	8	8	9	9	8	8	8	7	7
17	5	6	7	7	8	8	8	9	9	8	8	8	7
22	4	5	6	7	7	8	8	9	9	9	8	8	8
27	4	5	6	6	7	8	8	9	9	9	9	8	8
Dec. 2	+3	+4	+5	+6	+7	+7	+8	+8	+9	+9	+9	+9	+8
7	2	3	4	5	6	7	8	8	8	9	9	9	9
12	2	3	4	5	6	7	7	8	8	9	9	9	9
17	+1	2	3	4	5	6	7	8	8	8	9	9	9
22	0	1	2	3	4	6	6	7	8	8	9	9	9
27	-1	+1	+2	+3	+4	+5	+6	+7	+7	+8	+8	+9	+9
32	-1	0	+1	+2	+3	+4	+5	+6	+7	+8	+8	+8	+9
	^h 18·0	^h 18·5	^h 19·0	^h 19·5	^h 20·0	^h 20·5	^h 21·0	^h 21·5	^h 22·0	^h 22·5	^h 23·0	^h 23·5	^h 24·0

This table should be used without interpolation, using the date nearest to the date of observation, and the value of α nearest to the right ascension of the star.

The maximum value of the differential aberration for two objects separated by 1° is of the order $0^s.02 \sec \delta$ in right ascension, or $0^s.3$ in declination.

294 DIFFERENTIAL PRECESSION AND NUTATION, 1935

Date	<i>j</i>	<i>J</i>	<i>δ</i>	$\frac{\tan \delta}{15}$	$\frac{\sec^2 \delta}{225}$	$\frac{\sec \delta}{15}$	$\frac{\tan \delta \sec \delta}{225}$	$\sin \delta$	$\frac{\cos \delta}{15}$
Jan. I	1.29	^h 6 ^m 03	0	0.000	0.004	0.07	0.000	0.00	0.07
II	1.29	6 03	5	.006	.004	.07	.000	.09	.07
2I	1.28	6 03	10	.012	.005	.07	.001	.17	.07
3I	1.28	6 03	15	.018	.005	.07	.001	.26	.06
Feb. 10	1.28	6 03	20	.024	.005	.07	.002	.34	.06
20	1.27	6 03	25	0.031	0.005	0.07	0.002	0.42	0.06
Mar. 2	1.27	6 04	30	.038	.006	.08	.003	.50	.06
12	1.27	6 04	35	.047	.007	.08	.004	.57	.05
22	1.27	6 03	40	0.056	0.008	0.09	0.005	0.64	0.05
Apr. I	1.27	6 03	41	.058	.008	.09	.005	.66	.05
II	1.26	6 03	42	.060	.008	.09	.005	.67	.05
2I	1.26	6 03	43	.062	.008	.09	.006	.68	.05
May I	1.26	6 03	44	.064	.009	.09	.006	.69	.05
II	1.26	6 03	45	0.067	0.009	0.09	0.006	0.71	0.05
2I	1.25	6 03	46	.069	.009	.10	.007	.72	.05
3I	1.25	6 02	47	.071	.010	.10	.007	.73	.05
June 10	1.25	6 02	48	.074	.010	.10	.007	.74	.04
20	1.25	6 02	49	.077	.010	.10	.008	.75	.04
30	1.24	6 02	50	0.079	0.011	0.10	0.008	0.77	0.04
July 10	1.24	6 02	51	.082	.011	.11	.009	.78	.04
20	1.24	6 02	52	.085	.012	.11	.009	.79	.04
30	1.23	6 02	53	.088	.012	.11	.010	.80	.04
Aug. 9	1.23	6 02	54	.092	.013	.11	.010	.81	.04
19	1.23	6 02	55	0.095	0.014	0.12	0.011	0.82	0.04
29	1.23	6 02	56	.099	.014	.12	.012	.83	.04
Sept. 8	1.22	6 02	57	.103	.015	.12	.013	.84	.04
18	1.22	6 02	58	.107	.016	.13	.013	.85	.04
28	1.22	6 02	59	.111	.017	.13	.014	.86	.03
Oct. 8	1.22	6 02	60	0.115	0.018	0.13	0.015	0.87	0.03
18	1.22	6 02	61	.120	.019	.14	.017	.87	.03
28	1.22	6 02	62	.125	.020	.14	.018	.88	.03
Nov. 7	1.21	6 02	63	.131	.022	.15	.019	.89	.03
17	1.21	6 02	64	.137	.023	.15	.021	.90	.03
27	1.21	6 01	65	0.143	0.025	0.16	0.023	0.91	0.03
Dec. 7	1.20	6 01	66	.150	.027	.16	.025	.91	.03
17	1.20	6 01	67	.157	.029	.17	.027	.92	.03
27	1.20	6 01	68	.165	.032	.18	.029	.93	.02
37	1.20	6 01	69	.174	.035	.19	.032	.93	.02
The above values of <i>j</i> and <i>J'</i> are for reduction to the mean equinox of 1950.0. The values on pages 275-289 are for reduction to the mean equinox of 1935.0.			70	0.183	0.038	0.19	0.036	0.94	0.02
			71	.194	.042	.20	.040	.95	.02
			72	.205	.047	.22	.044	.95	.02
			73	.218	.052	.23	.050	.96	.02
			74	.232	.058	.24	.056	.96	.02
			75	0.249	0.066	0.26	0.064	0.97	0.02

If $\Delta \alpha$ and $\Delta \delta$, in units of 1^m and $1'$ respectively, are the observed differences of co-ordinates, in the sense moving object *minus* star, the necessary corrections for differential precession and nutation are—

$$\begin{aligned} \text{In R.A. } & j \sin(J + \alpha) \frac{\tan \delta}{15} \Delta \alpha - j \cos(J + \alpha) \frac{\sec^2 \delta}{225} \Delta \delta \text{ in seconds of time.} \\ \text{In Dec. } & j \cos(J + \alpha) \Delta \alpha \\ & \text{in seconds of arc.} \end{aligned}$$

NATURAL SINES AND COSINES

295

m	0 ^h		1 ^h		2 ^h		
	sin	cos	sin	cos	sin	cos	
0	0.000	1.000	0.259	0.966	0.500	0.866	60
1	.004	1.000	.263	.965	.504	.864	59
2	.009	1.000	.267	.964	.508	.862	58
3	.013	1.000	.271	.962	.511	.859	57
4	.017	1.000	.276	.961	.515	.857	56
5	0.022	1.000	0.280	0.960	0.519	0.855	55
6	.026	1.000	.284	.959	.522	.853	54
7	.031	1.000	.288	.958	.526	.850	53
8	.035	0.999	.292	.956	.530	.848	52
9	.039	0.999	.297	.955	.534	.846	51
10	0.044	0.999	0.301	0.954	0.537	0.843	50
11	.048	.999	.305	.952	.541	.841	49
12	.052	.999	.309	.951	.545	.839	48
13	.057	.998	.313	.950	.548	.836	47
14	.061	.998	.317	.948	.552	.834	46
15	0.065	0.998	0.321	0.947	0.556	0.831	45
16	.070	.998	.326	.946	.559	.829	44
17	.074	.997	.330	.944	.563	.827	43
18	.078	.997	.334	.943	.566	.824	42
19	.083	.997	.338	.941	.570	.822	41
20	0.087	0.996	0.342	0.940	0.574	0.819	40
21	.092	.996	.346	.938	.577	.817	39
22	.096	.995	.350	.937	.581	.814	38
23	.100	.995	.354	.935	.584	.812	37
24	.105	.995	.358	.934	.588	.809	36
25	0.109	0.994	0.362	0.932	0.591	0.806	35
26	.113	.994	.367	.930	.595	.804	34
27	.118	.993	.371	.929	.598	.801	33
28	.122	.993	.375	.927	.602	.799	32
29	.126	.992	.379	.926	.605	.796	31
30	0.131	0.991	0.383	0.924	0.609	0.793	30
31	.135	.991	.387	.922	.612	.791	29
32	.139	.990	.391	.921	.616	.788	28
33	.143	.990	.395	.919	.619	.785	27
34	.148	.989	.399	.917	.623	.783	26
35	0.152	0.988	0.403	0.915	0.626	0.780	25
36	.156	.988	.407	.914	.629	.777	24
37	.161	.987	.411	.912	.633	.774	23
38	.165	.986	.415	.910	.636	.772	22
39	.169	.986	.419	.908	.639	.769	21
40	0.174	0.985	0.423	0.906	0.643	0.766	20
41	.178	.984	.427	.904	.646	.763	19
42	.182	.983	.431	.903	.649	.760	18
43	.187	.982	.434	.901	.653	.758	17
44	.191	.982	.438	.899	.656	.755	16
45	0.195	0.981	0.442	0.897	0.659	0.752	15
46	.199	.980	.446	.895	.663	.749	14
47	.204	.979	.450	.893	.666	.746	13
48	.208	.978	.454	.891	.669	.743	12
49	.212	.977	.458	.889	.672	.740	11
50	0.216	0.976	0.462	0.887	0.676	0.737	10
51	.221	.975	.466	.885	.679	.734	9
52	.225	.974	.469	.883	.682	.731	8
53	.229	.973	.473	.881	.685	.728	7
54	.233	.972	.477	.879	.688	.725	6
55	0.238	0.971	0.481	0.877	0.692	0.722	5
56	.242	.970	.485	.875	.695	.719	4
57	.246	.969	.489	.872	.698	.716	3
58	.250	.968	.492	.870	.701	.713	2
59	.255	.967	.496	.868	.704	.710	1
60	0.259	0.966	0.500	0.866	0.707	0.707	0
	cos	sin	cos	sin	cos	sin	m
	5 ^h		4 ^h		3 ^h		

MEAN PLACES OF STARS, 1935

FOR JANUARY 1^d 290

Star's Name	Mag.	Right Ascension	Annual Variation	Annual Proper Motion	Declination	Annual Variation	Annual Proper Motion
2 Ceti	4.62	0 00 24.670	+3.0739	+0.0017	-17 41 51.66	+20.048	+0.004
α Andromedæ	2.15	0 05 01.310	3.0985	+ .0094	+28 43 53.96	19.882	- .157
β Cassiopeia	2.42	0 05 41.708	3.1943	+ .0665	+58 47 28.84	19.861	- .177
γ Pegasi*	2.87	0 09 53.099	3.0876	- .0006	+14 49 20.50	20.023	- .002
ι Ceti	3.75	0 16 06.953	3.0565	- .0013	- 9 11 02.44	19.972	-0.022
ζ Tucanae	4.34	0 16 41.916	+3.1361	+0.2742	-65 15 23.78	+21.162	+1.171
d Piscium	5.58	0 17 14.999	3.0859	- .0009	+ 7 49 46.02	20.005	+0.018
44 Piscium	5.99	0 22 04.139	3.0752	- .0013	+ 1 34 48.06	19.948	- .003
β Hydri	2.90	0 22 21.979	3.1728	+ .6928	-77 37 13.25	20.261	+ .312
α Phœnicis	2.44	0 23 04.549	2.9674	+ .0182	-42 39 31.41	19.557	- .385
12 Ceti	6.05	0 26 43.246	+3.0617	+0.0005	- 4 18 58.30	+19.907	-0.001
ϵ Andromedæ	4.52	0 35 06.851	3.1676	- .0182	+28 57 33.05	19.565	- .244
δ Andromedæ	3.49	0 35 50.700	3.2049	+ .0092	+30 30 20.00	19.712	- .087
α Cassiopeia*	Var.	0 36 48.246	3.3970	+ .0051	+56 10 52.62	19.762	- .024
β Ceti	2.24	0 40 19.654	3.0116	+ .0162	-18 20 34.92	19.777	+ .043
δ Piscium	4.55	0 45 18.431	+3.1117	+0.0054	+ 7 13 54.07	+19.610	-0.043
20 Ceti	4.92	0 49 41.050	3.0655	.0000	- 1 29 48.46	19.570	- .005
γ Cassiopeia	2.25	0 52 46.032	3.6114	+ .0024	+60 21 54.88	19.515	.000
μ Andromedæ	3.94	0 53 08.211	3.3263	+ .0122	+38 08 49.93	19.544	+ .037
α Sculptoris	4.39	0 55 28.512	2.8910	+ .0008	-29 42 29.89	19.471	+ .012
ϵ Piscium	4.45	0 59 33.988	+3.1125	-0.0059	+ 7 32 26.34	+19.403	+0.032
72 Piscium	5.65	1 01 39.236	3.1659	+ .0004	+14 35 49.57	19.389	+ .066
β Phœnicis* m .	3.35	1 03 11.192	2.6784	- .0035	-47 03 58.34	19.305	+ .018
β Andromedæ	2.37	1 06 05.071	3.3556	+ .0138	+35 16 35.25	19.107	- .109
ζ^1 Piscium*	5.57	1 10 19.920	3.1336	+ .0094	+ 7 13 55.85	19.063	- .044
θ Ceti	3.83	1 20 46.407	+2.9985	-0.0054	- 8 31 05.51	+18.604	-0.208
δ Cassiopeia	2.80	1 21 32.651	3.9146	+ .0387	+59 53 53.69	18.747	- .041
γ Phœnicis	3.40	1 25 32.671	2.6057	- .0025	-43 39 02.29	18.465	- .198
η Piscium	3.72	1 28 00.047	3.2087	+ .0015	+15 00 40.92	18.585	.000
α Eridani*	0.60	1 35 17.783	2.2352	+ .0117	-57 33 59.14	18.310	- .026
ν Piscium	4.68	1 38 02.723	+3.1210	-0.0020	+ 5 09 34.01	+18.250	+0.013
σ Piscium	4.50	1 41 57.460	3.1669	+ .0046	+ 8 49 53.18	18.155	+ .063
ζ Ceti	3.92	1 48 15.034	2.9608	+ .0021	-10 39 19.46	17.823	- .027
α Trianguli	3.58	1 49 22.142	3.4172	+ .0003	+29 15 46.68	17.573	- .231
ϵ Cassiopeia	3.44	1 49 41.684	4.3035	+ .0041	+63 21 03.56	17.776	- .015
β Arietis	2.72	1 51 02.636	+3.3120	+0.0065	+20 29 27.95	+17.633	-0.104
α Hydri	3.02	1 56 43.339	1.8908	+ .0372	-61 53 07.82	17.540	+ .040
ν Ceti	4.18	1 56 56.502	2.8261	+ .0088	-21 23 31.16	17.479	- .012
γ^1 Andromedæ*	2.28	1 59 53.966	3.6784	+ .0038	+42 01 07.69	17.318	- .045
α Arietis	2.23	2 03 30.188	3.3796	+ .0133	+23 09 21.55	17.062	- .141
β Trianguli	3.08	2 05 40.030	+3.5664	+0.0114	+34 40 50.91	+17.069	-0.036
ξ^1 Ceti	4.54	2 09 33.054	3.1787	- .0018	+ 8 32 34.16	16.931	+ .005
67 Ceti	5.70	2 13 44.371	2.9922	+ .0060	- 6 43 14.78	16.628	- .098
ϕ Eridani	3.78	2 14 11.233	+2.1430	+0.0088	-51 48 44.44	+16.690	-0.015

 γ Pegasi. *Algenib* α Cassiopeia. 2^m.1 to 2^m.6 β Phœnicis. 4^m.1-4^m.1, 1^s.4, 359° ζ^1 Piscium. 6^m.49 (ζ^2), 24^s, 64° α Eridani. *Achernar* γ^1 Andromedæ. 5^m.08 (γ^2), 10^s, 63°

MEAN PLACES OF STARS, 1935

297

FOR JANUARY 1^d 290

Star's Name	Mag.	Right Ascension	Annual Variation	Annual Proper Motion	Declination	Annual Variation	Annual Proper Motion
θ Arietis	5.69	^h 2 ^m 14 ^s 30.266	+3.3352	-0.0013	+19 36 05.25	+16.695	+0.005
\circ Ceti*	Var.	2 16 03.599	3.0294	-0.0008	- 3 16 18.37	16.392	- .223
κ Fornacis	5.37	2 19 34.030	2.7443	+ .0135	-24 06 39.40	16.379	- .061
δ Hydri	4.26	2 20 35.163	1.0648	- .0090	-63 57 17.47	16.402	+ .013
ξ^2 Ceti	4.34	2 24 41.949	3.1885	+ .0022	+ 8 10 11.11	16.182	+ .002
ν Ceti	5.04	2 32 27.566	+3.1471	-0.0025	+ 5 18 38.37	+15.755	-0.015
δ Ceti	4.04	2 36 08.873	3.0742	+ .0005	+ 0 02 57.13	15.578	+ .009
γ^2 Ceti*	3.69	2 39 55.781	3.1076	- .0098	+ 2 57 46.63	15.219	- .139
π Ceti	4.39	2 41 01.654	2.8547	- .0008	-14 07 59.09	15.285	- .011
β Fornacis	4.50	2 46 22.142	2.5098	+ .0058	-32 40 40.71	15.161	+ .171
σ Arietis	5.46	2 47 53.945	+3.3108	+0.0014	+14 48 55.35	+14.881	-0.020
ϵ Arietis* <i>m.</i>	4.64	2 55 29.356	3.4282	- .0018	+21 04 53.58	14.449	.000
θ^1 Eridani*	3.42	2 55 47.763	2.2739	- .0053	-40 33 51.25	14.461	+ .031
α Ceti	2.82	2 58 52.713	3.1351	- .0010	+ 3 50 09.24	14.174	- .068
γ Persei	3.08	3 00 04.412	4.3380	- .0009	+53 15 12.42	14.170	+ .001
ρ Persei*	Var.	3 01 00.142	+3.8411	+0.0108	+38 35 23.17	+14.008	-0.103
μ Horologii	5.16	3 02 04.750	1.4128	- .0096	-59 59 21.10	13.996	- .048
β Persei*	Var.	3 03 55.812	3.8995	- .0002	+40 42 23.93	13.932	+ .004
δ Arietis	4.53	3 07 54.421	3.4289	+ .0103	+19 28 55.75	13.674	- .002
τ^1 Arietis	5.17	3 17 28.147	3.4622	+ .0017	+20 54 50.51	13.029	- .023
α Persei	1.90	3 19 40.219	+4.2779	+0.0023	+49 37 53.39	+12.886	-0.020
\circ Tauri	3.80	3 21 18.692	3.2271	- .0051	+ 8 48 05.16	12.728	- .068
f Tauri	4.28	3 27 16.816	3.3110	+ .0010	+12 42 55.11	12.398	+ .008
ϵ Eridani	3.81	3 29 51.962	2.8259	- .0664	- 9 40 37.54	12.238	+ .027
45 G Horologii	5.60	3 30 38.292	1.7873	+ .0076	-50 35 54.17	12.249	+ .091
τ^5 Eridani	4.32	3 30 54.887	+2.6484	+0.0018	-21 50 59.26	+12.117	-0.021
11 Tauri	6.15	3 36 53.027	3.5818	+ .0005	+25 07 14.65	11.711	- .008
δ Persei	3.10	3 38 17.200	4.2674	+ .0028	+47 34 53.20	11.589	- .030
δ Eridani	3.72	3 40 07.952	2.8738	- .0065	- 9 58 56.17	12.234	+ .747
17 Tauri	3.81	3 41 00.604	3.5606	+ .0008	+23 54 37.57	11.383	- .041
η Tauri	2.96	3 43 36.916	+3.5642	+0.0008	+23 54 20.16	+11.196	-0.041
γ Hydri	3.17	3 48 13.383	-0.9429	+ .0109	-74 26 18.80	11.018	+ .118
ζ Persei	2.91	3 50 02.376	+3.7687	- .0002	+31 41 31.61	10.756	- .010
ϵ Persei*	2.96	3 53 29.064	4.0232	+ .0015	+39 49 25.97	10.491	- .021
γ Eridani	3.19	3 54 59.695	2.7985	+ .0038	-13 41 31.95	10.294	- .105
λ Tauri*	Var.	3 57 04.518	+3.3227	-0.0009	+12 18 29.20	+10.236	-0.007
A Tauri	4.50	4 00 50.843	3.5451	+ .0058	+21 54 21.09	9.906	- .052
43 Tauri	5.67	4 05 22.489	3.4939	+ .0070	+19 26 20.10	9.588	- .024
\circ^1 Eridani	4.14	4 08 41.413	2.9278	.0000	- 7 00 20.51	9.449	+ .092
α Horologii	3.83	4 11 50.722	1.9861	+ .0020	-42 27 12.99	8.917	- .195
α Reticuli	3.36	4 13 34.899	+0.7692	+0.0047	-62 38 10.15	+ 9.029	+0.052
ν^4 Eridani* <i>m.</i>	3.59	4 15 25.984	2.2694	+ .0042	-33 57 21.18	8.837	+ .006
γ Tauri	3.86	4 16 05.413	+3.4127	+0.0072	+15 28 20.00	+ 8.762	-0.018

\circ Ceti. *Mira*. 2^m.0 to 9^m.6 ρ Persei. 3^m.3 to 4^m.1 λ Tauri. 3^m.8 to 4^m.2
 γ^1 Ceti. 6^m.16 (γ^1), 3", 293° β Persei. *Algol*. 2^m.3 to 3^m.5 ν^4 Eridani. 4^m.0-5^m.0, less
 ϵ Arietis. 5^m.25-5^m.55, 1".4, 203° ϵ Persei. 7^m.93, 9", 9° than 0".2
 θ^1 Eridani. 4^m.42 (θ^1), 8", 87°

MEAN PLACES OF STARS, 1935

FOR JANUARY 1st 290

Star's Name	Mag.	Right Ascension	Annual Variation	Annual Proper Motion	Declination	Annual Variation	Annual Proper Motion
ε Tauri	3.63	^{h m s} 4 24 49.025	+3.5019	+0.0070	+19 02 16.26	+8.055	-0.032
α Tauri*	1.06	4 32 11.248	3.4412	+0.0039	+16 22 48.63	7.308	-0.185
α Doradus	3.47	4 32 35.322	1.2949	+0.0049	-55 10 43.28	7.466	+0.005
53 Eridani	3.98	4 35 12.133	2.7474	-0.0050	-14 25 47.04	7.097	-0.151
τ Tauri	4.33	4 38 20.381	3.5996	-0.0007	+22 50 02.14	6.983	-0.009
μ Eridani	4.18	4 42 14.998	+2.9990	+0.0003	-3 22 20.68	+6.661	-0.009
π ³ Orionis	3.31	4 46 18.538	3.2559	+0.0306	+6 50 57.62	6.356	+0.022
9 Camelopardi	4.38	4 47 34.403	5.9579	+0.0005	+66 14 06.01	6.238	+0.009
ι Aurigæ	2.90	4 52 45.360	3.9053	-0.0005	+33 03 54.06	5.784	-0.013
ε Aurigæ*	Var.	4 57 17.962	4.3036	-0.0002	+43 43 44.95	5.413	-0.002
ι Tauri	4.70	4 59 12.403	+3.5846	+0.0037	+21 29 55.58	+5.212	-0.042
η Aurigæ	3.28	5 01 57.100	4.2053	+0.0019	+41 08 54.64	4.953	-0.069
ε Leporis	3.29	5 02 42.455	2.5385	+0.0007	-22 27 25.65	4.888	-0.071
β Eridani	2.92	5 04 39.135	2.9486	-0.0070	-5 10 08.60	4.718	-0.076
μ Leporis	3.30	5 10 00.538	2.6927	+0.0008	-16 16 52.20	4.312	-0.025
β Orionis*	0.34	5 11 24.746	+2.8824	-0.0006	-8 16 31.23	+4.222	+0.004
α Aurigæ*	0.21	5 11 52.999	4.4309	+0.0076	+45 56 02.58	3.757	-0.421
ο Orionis	4.65	5 18 26.513	3.0620	-0.0008	-0 26 42.50	3.619	+0.004
η Orionis* m.	3.44	5 21 12.385	3.0152	-0.0013	-2 27 20.09	3.374	-0.003
γ Orionis*	1.70	5 21 38.557	3.2170	-0.0013	+6 17 32.66	3.333	-0.006
β Tauri	1.78	5 22 10.812	+3.7915	+0.0013	+28 33 15.50	+3.118	-0.174
β Leporis	2.96	5 25 27.488	2.5694	-0.0015	-20 48 35.96	2.925	-0.085
20 G Pictoris	5.54	5 28 22.130	1.6486	+0.0011	-47 07 24.89	2.629	-0.128
δ Orionis*	2.48	5 28 41.042	3.0643	-0.0007	-0 20 44.59	2.737	+0.006
α Leporis	2.69	5 29 51.705	2.6453	-0.0007	-17 52 02.87	2.638	+0.010
ι Orionis*	2.89	5 32 15.110	+2.9341	-0.0006	-5 57 03.63	+2.433	+0.013
ε Orionis	1.75	5 32 54.807	3.0434	-0.0008	-1 14 30.96	2.368	+0.004
β Doradus	3.81	5 33 03.413	0.5172	-0.0031	-62 31 55.49	2.355	+0.005
ζ Tauri	3.00	5 33 45.477	3.5850	-0.0004	+21 06 16.67	2.272	-0.018
α Columbae	2.75	5 37 17.576	2.1710	-0.0015	-34 06 27.15	1.966	-0.016
ζ ¹ Orionis*	2.05	5 37 28.635	+3.0265	-0.0006	-1 58 31.36	+1.976	+0.009
130 Tauri	5.51	5 43 38.658	3.4972	-0.0013	+17 42 22.94	1.421	-0.008
κ Orionis	2.20	5 44 40.353	2.8450	-0.0002	-9 41 28.86	1.340	0.000
β Columbae	3.22	5 48 39.977	2.1133	+0.0026	-35 47 30.17	1.395	+0.404
α Orionis*	Var.	5 51 39.086	3.2474	+0.0011	+7 23 47.53	0.744	+0.014
β Aurigæ	2.07	5 54 45.554	+4.4003	-0.0059	+44 56 34.54	+0.457	-0.001
θ Aurigæ*	2.72	5 55 17.246	4.0908	+0.0034	+37 12 36.04	+0.336	-0.076
ι Geminorum	4.30	6 00 10.041	3.6461	-0.0014	+23 16 06.90	-0.114	-0.100
ν Orionis	4.40	6 03 51.545	3.4248	-0.0006	+14 46 40.35	0.357	-0.019
η Geminorum*	Var.	6 10 57.152	3.6208	-0.0058	+22 31 38.53	0.969	-0.011
ζ Canis Majoris	3.10	6 17 48.941	+2.3013	-0.0015	-30 01 59.93	-1.548	+0.008
μ Geminorum	3.19	6 19 01.630	3.6290	+0.0031	+22 32 55.22	1.773	-0.110
β Canis Majoris	1.99	6 19 50.147	+2.6411	-0.0013	-17 55 20.56	-1.729	+0.003

α Tauri. *Aldebaran*ε Aurigæ. 3^m.3 to 4^m.1β Orionis. *Rigel*. 6^m.66, 10°, 202°α Aurigæ. *Capella*η Orionis. 3^m.8-5^m.0, 1°, 81°γ Orionis. *Bellatrix*δ Orionis. 6^m.87, 53°, 359°ι Orionis. 7^m.33, 12°, 142°ζ¹ Orionis. 4^m.21 (ζ¹), 2°, 6, 160°α Orionis. *Betelgeuse*. 0^m.5 to 1^m.1θ Aurigæ. 7^m.5, 2°, 8, 331°η Geminorum. 3^m.3 to 4^m.2

MEAN PLACES OF STARS, 1935

299

FOR JANUARY 1^d 290

Star's Name	Mag.	Right Ascension	Annual Variation	Annual Proper Motion	Declination	Annual Variation	Annual Proper Motion
α Argus*	-0.86	^h 6 ^m 22 ^s 30.458	+1.3308	+0.0009	-52 39 33.64	-1.935	+0.030
ν Geminorum	4.06	6 25 06.167	3.5619	-0.0013	+20 15 17.94	2.202	-0.012
γ Geminorum	1.93	6 33 57.376	3.4653	+0.0019	+16 27 22.96	3.002	-0.043
ν Argus	3.18	6 35 46.253	1.8346	-0.0015	-43 08 16.69	3.116	-0.001
ϵ Geminorum	3.18	6 39 55.962	3.6908	-0.0014	+25 11 49.89	3.488	-0.013
ξ Geminorum	3.40	6 41 38.429	+3.3666	-0.0090	+12 58 02.25	-3.812	-0.190
α Canis Maj.* <i>cg</i>	-1.58	6 42 17.098	2.6433	-0.0375	-16 37 32.48	4.885	-1.208
α Pictoris	3.30	6 47 31.447	0.6153	-0.0117	-61 52 16.23	3.859	+0.267
τ Argus	2.83	6 48 19.279	1.4866	+0.0008	-50 32 10.52	4.253	-0.058
θ Canis Majoris	4.25	6 51 10.133	2.7868	-0.0102	-11 57 21.19	4.451	-0.013
ϵ Canis Maj.*	1.63	6 56 04.187	+2.3568	-0.0010	-28 52 56.97	-4.853	+0.002
22 Canis Majoris	3.68	6 59 07.681	2.3887	-0.0019	-27 50 26.49	5.117	-0.003
ζ Geminorum*	Var.	7 00 15.229	3.5583	-0.0015	+20 40 02.42	5.207	+0.002
o ^a Canis Majoris	3.12	7 00 18.541	2.5045	-0.0011	-23 44 13.71	5.212	+0.002
γ Canis Majoris	4.07	7 00 48.995	2.7137	-0.0008	-15 32 09.16	5.260	-0.003
δ Canis Majoris	1.98	7 05 44.830	+2.4385	-0.0014	-26 17 19.69	-5.664	+0.008
51 Geminorum	5.31	7 09 38.305	3.4448	-0.0003	+16 16 15.13	6.037	-0.040
π Argus	2.74	7 14 50.745	2.1180	-0.0020	-36 58 46.38	6.411	+0.019
δ Geminorum*	3.52	7 16 14.482	+3.5830	-0.0029	+22 06 13.21	6.555	-0.010
δ Volantis	4.02	7 16 52.072	-0.0265	-0.0017	-67 50 17.56	6.593	+0.004
η Canis Majoris	2.43	7 21 31.331	+2.3715	-0.0021	-29 10 30.93	-6.977	+0.003
β Canis Minoris	3.09	7 23 37.530	3.2531	-0.0047	+8 25 18.56	7.188	-0.036
σ Argus*	3.28	7 27 10.004	1.9014	-0.0077	-43 10 08.07	7.252	+0.189
α Geminorum* <i>cg</i>	1.58	7 30 27.223	3.8305	-0.0142	+32 01 57.01	7.810	-0.103
ϱ Carinæ	4.92	7 34 03.241	1.4842	+0.0017	-52 23 17.17	8.019	-0.023
α Canis Min.* <i>cg</i>	0.48	7 35 53.964	+3.1397	-0.0486	+5 23 34.40	-9.179	-1.034
26 Monocerotis	4.07	7 38 08.442	2.8656	-0.0062	-9 23 53.64	8.343	-0.019
β Geminorum*	1.21	7 41 20.416	3.6718	-0.0484	+28 11 05.13	8.627	-0.050
ξ Argus	3.47	7 46 33.548	2.5223	-0.0015	-24 41 43.84	8.988	-0.001
9 Puppis* <i>m</i> .	5.34	7 48 45.648	2.7776	-0.0051	-13 43 27.70	9.497	-0.338
χ Geminorum	5.04	7 59 31.685	+3.6856	-0.0029	+27 58 41.13	-10.030	-0.044
ζ Argus	2.27	8 01 17.909	2.1076	-0.0037	-39 49 08.42	10.099	+0.021
ρ Argus	2.88	8 04 46.470	2.5540	-0.0073	-24 06 56.78	10.330	+0.051
γ Argus*	1.92	8 07 31.669	1.8475	-0.0025	-47 08 39.05	10.576	+0.010
20 Puppis	5.05	8 10 20.634	2.7567	-0.0021	-15 35 28.08	10.789	+0.005
β Cancri	3.76	8 12 59.448	+3.2537	-0.0041	+9 23 14.03	-11.034	-0.045
d ¹ Cancri	5.88	8 19 38.620	3.4361	-0.0044	+18 32 32.25	11.499	-0.027
ϵ Argus	1.74	8 21 10.839	1.2311	-0.0051	-59 17 59.15	11.563	+0.018
30 Monocerotis	3.95	8 22 24.741	2.9975	-0.0054	-3 41 35.67	11.695	-0.026
o Ursæ Majoris	3.47	8 24 52.788	4.9941	-0.0187	+60 56 14.54	11.953	-0.110
η Cancri	5.52	8 28 57.101	+3.4702	-0.0040	+20 39 47.91	-12.174	-0.045
γ Cancri	4.73	8 39 31.602	3.4729	-0.0083	+21 42 12.78	12.891	-0.031
α Pyxidis	3.70	8 40 58.695	+2.4090	-0.0029	-32 57 03.64	-12.929	+0.020

α Argus. *Canopus*

α Canis Majoris. *Sirius*. -1^m.58-
8^m.44, 8^m, 34^m

ϵ Canis Majoris. 9^m, 8^m, 160^m

ζ Geminorum. 3^m.7 to 4^m.1

δ Geminorum. 8^m.5, 7^m, 212^m

σ Argus. 8^m, 23^m, 73^m

α Geminorum. *Castor*. 1^m.99-
2^m.85, 4^m, 207^m

α Canis Minoris. *Procyon*. 0^m.5-
13^m.5, 4^m.3, 304^m

β Geminorum. *Pollux*

9 Puppis. 5^m.8-6^m.4, less
than 0^m.7, 23 years

γ Argus. 4^m.79, 41^m, 220^m

MEAN PLACES OF STARS, 1935

FOR JANUARY 1^d 290

Star's Name	Mag.	Right Ascension	Annual Variation	Annual Proper Motion	Declination	Annual Variation	Annual Proper Motion
δ Argus* m.	2.01	8 42 54.474	+1.6553	+0.0004	-54 28 10.45	-13.151	-0.073
ε Hydræ* m.	3.53	8 43 20.082	3.1774	-0.0136	+ 6 39 30.41	13.155	-0.050
ζ Hydræ	3.30	8 51 57.508	3.1715	-0.0076	+ 6 11 38.62	13.653	+0.014
ι Ursæ Majoris	3.12	8 54 45.972	4.1125	-0.0449	+48 17 53.80	14.083	-0.237
α Cancrī	4.27	8 54 55.999	3.2813	+0.0012	+12 06 37.93	13.887	-0.031
κ Cancrī	5.14	9 04 13.657	+3.2498	-0.0023	+10 55 51.32	-14.439	-0.007
λ Argus	2.22	9 05 36.183	2.2053	-0.0033	-43 10 09.55	14.501	+0.015
ξ Cancrī	5.22	9 05 37.456	3.4501	-0.0009	+22 18 34.10	14.514	+0.003
β Argus	1.80	9 12 29.714	0.6639	-0.0298	-69 26 57.24	14.822	+0.103
ι Argus	2.25	9 15 21.028	1.6061	-0.0030	-59 00 07.00	15.081	+0.009
83 Cancrī	6.60	9 15 21.324	+3.3494	-0.0091	+17 58 54.91	-15.224	-0.134
40 Lyncis	3.30	9 17 06.026	3.6574	-0.0186	+34 40 06.80	15.174	+0.016
θ Pyxididis	4.93	9 18 36.804	2.6548	-0.0021	-25 41 16.58	15.285	-0.009
κ Argus	2.63	9 20 05.956	1.8567	-0.0024	-54 43 56.63	15.349	+0.011
α Hydræ	2.16	9 24 23.569	2.9478	-0.0017	- 8 22 33.42	15.564	+0.034
ψ Argus* m.	3.64	9 28 08.252	+2.3614	-0.0174	-40 10 52.85	-15.727	+0.075
ξ Leonis	5.12	9 28 26.618	3.2342	-0.0071	+11 35 19.26	15.897	-0.079
θ Ursæ Majoris	3.26	9 28 31.254	4.0182	-0.1037	+51 58 28.96	16.365	-0.542
N Velorum	3.04	9 29 14.601	1.8213	-0.0058	-56 44 49.31	15.857	+0.004
κ Hydræ	4.96	9 37 11.325	2.8752	-0.0028	-14 02 11.82	16.299	-0.022
o Leonis	3.76	9 37 40.959	+3.2022	-0.0105	+10 11 20.27	-16.336	-0.035
ε Leonis	3.12	9 42 09.892	3.4067	-0.0041	+24 04 28.10	16.539	-0.013
υ Argus*	3.15	9 45 28.629	1.4995	-0.0029	-64 46 11.59	16.676	+0.013
υ Ursæ Majoris	3.89	9 46 23.042	4.2752	-0.0391	+59 20 44.13	16.887	-0.155
μ Leonis	4.10	9 49 04.237	3.4137	-0.0166	+26 18 50.39	16.915	-0.054
π Leonis	4.89	9 56 46.764	+3.1706	-0.0029	+ 8 21 24.85	-17.237	-0.021
α Leonis*	1.34	10 04 54.706	3.1952	-0.0178	+12 17 08.45	17.563	+0.007
q Velorum	4.09	10 12 00.209	2.5158	-0.0148	-41 47 57.44	17.814	+0.045
22 Sextantis	5.40	10 14 23.948	2.9809	-0.0113	- 7 44 36.75	17.942	+0.012
q Carinæ	3.44	10 14 54.628	2.0034	-0.0022	-61 00 25.36	17.967	+0.006
γ ¹ Leonis*	2.61	10 16 23.483	+3.3083	+0.0209	+20 10 15.45	-18.184	-0.154
μ Ursæ Majoris	3.21	10 18 27.837	3.5778	-0.0078	+41 49 37.55	18.081	+0.028
μ Hydræ	4.06	10 22 56.690	2.9007	-0.0096	-16 30 13.85	18.352	-0.078
α Antiliæ	4.42	10 24 10.438	2.7431	-0.0073	-30 44 09.80	18.295	+0.022
ρ Leonis	3.85	10 29 23.369	3.1591	-0.0013	+ 9 38 30.06	18.500	-0.002
34 Sextantis	6.63	10 39 16.103	+3.0984	-0.0062	+ 3 55 23.57	-18.791	+0.022
θ Argus	3.03	10 40 37.981	2.1378	-0.0031	-64 03 12.19	18.835	+0.019
η Argus*	Var.	10 42 32.012	2.3250	-0.0004	-59 20 32.36	18.906	+0.003
μ Argus*	2.86	10 43 58.136	2.5776	+0.0066	-49 04 34.15	18.996	-0.045
ι Leonis	5.27	10 45 50.475	3.1535	-0.0012	+10 53 22.87	19.026	-0.022
ν Hydræ	3.32	10 46 24.933	+2.9593	+0.0060	-15 51 10.78	-18.817	+0.203
ι Antiliæ	4.70	10 53 41.040	2.7935	+0.0056	-36 47 16.05	19.334	-0.123
d Leonis	5.05	10 57 12.214	+3.0982	+0.0002	+ 3 58 01.01	-19.309	-0.013

δ Argus. 2^m.1-5^m.2, 3", 161°
 ε Hydræ. 3^m.8-5^m.3, less than
 0°.4, 15 years, 7^m, 3", 251°

ψ Argus. 3^m.8-5^m.8, 0°.7, 293°,
 34 years
 υ Argus. 6^m.03, 5", 128°
 α Leonis. *Regulus*

γ¹ Leonis. 3^m.80 (γ²), 4",
 119°
 η Argus. Now 7^m.8
 μ Argus. 7^m, 1°.8, 72°

MEAN PLACES OF STARS, 1935

301

FOR JANUARY 1st 290

Star's Name	Mag.	Right Ascension	Annual Variation	Annual Proper Motion	Declination	Annual Variation	Annual Proper Motion
β Ursæ Majoris	2.44	^h 10 ^m 57 55.905	+3.6272	+0.0094	+56° 43' 52.84"	-19.277	+0.036
α Ursæ Majoris*	1.95	10 59 43.948	3.7110	-0.0181	+62 06 08.44	19.422	-0.068
χ Leonis	4.66	11 01 39.861	3.0946	-0.0238	+ 7 41 16.01	19.445	-0.047
ψ Ursæ Majoris	3.15	11 06 00.962	3.3763	-0.0069	+44 51 05.60	19.520	-0.030
β Crateris	4.52	11 08 27.457	2.9489	-0.0008	-22 28 14.14	19.638	-0.099
δ Leonis	2.58	11 10 39.212	+3.1915	+0.0096	+20 52 48.48	-19.715	-0.134
θ Leonis	3.41	11 10 49.820	3.1483	-0.0051	+15 47 06.60	19.664	-0.080
δ Crateris	3.82	11 16 05.307	2.9985	-0.0091	-14 25 35.39	19.472	+0.204
τ Leonis	5.18	11 24 35.640	3.0850	+0.0005	+ 3 12 52.02	19.817	-0.012
λ Draconis	4.06	11 27 34.064	3.5743	-0.0079	+69 41 24.29	19.861	-0.017
ξ Hydræ	3.72	11 29 47.980	+2.9481	-0.0173	-31 29 51.72	-19.911	-0.041
λ Centauri	3.34	11 32 46.417	2.7616	-0.0050	-62 39 35.89	19.913	-0.010
ν Leonis	4.47	11 33 37.174	3.0713	-0.0005	- 0 27 52.88	19.867	+0.044
ν Virginis	4.20	11 42 31.071	3.0833	-0.0020	+ 6 53 37.34	20.171	-0.185
β Leonis*	2.23	11 45 44.690	3.0601	-0.0350	+14 56 07.65	20.122	-0.117
β Virginis	3.80	11 47 18.508	+3.1246	+0.0489	+ 2 07 52.18	-20.281	-0.268
B Centauri	4.71	11 47 53.244	2.9946	-0.0082	-44 48 42.19	20.031	-0.016
γ Ursæ Majoris	2.54	11 50 25.200	3.1599	+0.0099	+54 03 22.68	20.013	+0.013
π Virginis	4.57	11 57 32.494	3.0740	-0.0007	+ 6 58 36.60	20.070	-0.027
σ Virginis	4.24	12 01 53.861	3.0557	-0.0155	+ 9 05 38.69	19.991	+0.052
δ Centauri	2.88	12 04 58.833	+3.1036	-0.0045	-50 21 37.44	-20.053	-0.014
ϵ Corvi	3.21	12 06 46.653	3.0838	-0.0054	-22 15 29.52	20.020	+0.015
δ Crucis	3.08	12 11 40.871	3.1781	-0.0055	-58 23 14.19	20.024	-0.006
δ Ursæ Majoris	3.44	12 12 12.971	2.9731	+0.0114	+57 23 37.01	20.012	+0.003
γ Corvi	2.78	12 12 27.572	3.0837	-0.0118	-17 10 51.89	19.993	+0.022
β Chamæleontis	4.38	12 14 29.639	+3.4934	-0.0121	-78 57 05.23	-19.996	+0.008
η Virginis	4.00	12 16 34.718	3.0686	-0.0049	- 0 18 20.38	20.010	-0.018
α^1 Crucis*	1.58	12 22 58.032	3.3272	-0.0052	-62 44 20.43	19.964	-0.021
δ Corvi*	3.11	12 26 29.815	3.1023	-0.0153	-16 09 13.25	20.047	-0.137
γ Crucis	1.61	12 27 32.836	3.3194	+0.0020	-56 44 57.48	20.161	-0.262
κ Draconis	3.88	12 30 43.131	+2.5668	-0.0117	+70 08 46.59	-19.858	+0.006
β Corvi	2.84	12 30 58.073	3.1491	-0.0005	-23 02 14.77	19.916	-0.055
α Muscæ	2.94	12 33 17.144	3.5638	-0.0071	-68 46 39.29	19.848	-0.015
γ Centauri* <i>m.</i>	2.38	12 37 55.284	3.3021	-0.0205	-48 36 10.50	19.777	-0.007
γ Virginis* <i>m.</i>	2.91	12 38 21.836	3.0387	-0.0386	- 1 05 35.05	19.748	+0.016
ρ Virginis	4.95	12 38 35.617	+3.0359	+0.0048	+10 35 36.89	-19.853	-0.092
β Muscæ* <i>m.</i>	3.26	12 42 16.374	3.6665	-0.0056	-67 45 09.15	19.722	-0.019
β Crucis	1.50	12 43 54.517	3.4963	-0.0058	-59 20 01.12	19.693	-0.015
35 Virginis	6.66	12 44 32.731	3.0542	-0.0010	+ 3 55 38.46	19.671	-0.004
31 Comæ	5.07	12 48 32.005	2.9226	-0.0018	+27 53 38.51	19.612	-0.016
ψ Virginis	4.91	12 50 58.147	+3.1183	-0.0023	- 9 11 10.50	-19.567	-0.017
ϵ Ursæ Majoris	1.68	12 51 10.490	2.6421	+0.0131	+56 18 44.92	19.547	-0.000
δ Virginis	3.66	12 52 19.649	+3.0211	-0.0321	+ 3 45 01.39	-19.576	-0.052

α Ursæ Majoris. *Dubhe*. Double,
less than 1"

β Leonis. *Denebola*

α^1 Crucis. 2^m.09 (α^2), 5", 116°

δ Corvi. 8^m, 24", 214°

γ Centauri. 3^m.1-3^m.1, 0", 4,
23°

γ Virginis. 3^m.65-3^m.68, 6",
138°

β Muscæ. 3^m.9-4^m.2, 1", 3, 3°

MEAN PLACES OF STARS, 1935

FOR JANUARY 1^d 290

Star's Name	Mag.	Right Ascension	Annual Variation	Annual Proper Motion	Declination	Annual Variation	Annual Proper Motion
12 ^a Canum Ven.*	2.90	^h 12 52 ^m 59.368	+2.8071	-0.0209	+38 40 08.38	-19.460	+0.051
δ Muscæ	3.63	12 57 46.211	4.1083	+0.0565	-71 11 55.85	19.447	-0.037
ε Virginis	2.95	12 58 56.405	2.9857	-0.0194	+11 18 29.56	19.359	+0.026
θ Virginis*	4.46	13 06 34.879	3.1048	-0.0030	-5 11 32.41	19.233	-0.029
γ Hydræ	3.33	13 15 22.953	3.2589	+0.0042	-22 49 44.99	19.021	-0.052
ι Centauri	2.91	13 16 56.116	+3.3683	-0.0289	-36 22 11.64	-19.011	-0.086
ζ ¹ Ursæ Majoris*	2.40	13 21 18.664	2.4169	+0.0134	+55 15 51.51	18.823	-0.027
α Virginis*	1.21	13 21 45.897	3.1588	-0.0034	-10 49 21.26	18.812	-0.030
i Virginis	5.59	13 23 16.867	3.1673	-0.0099	-12 22 11.91	18.756	-0.021
ζ Virginis	3.44	13 31 22.704	3.0558	-0.0196	-0 15 51.06	18.432	+0.040
ε Centauri	2.56	13 35 45.355	+3.7930	-0.0031	-53 08 11.07	-18.328	-0.008
m Virginis	5.16	13 38 11.808	3.1475	-0.0072	-8 22 32.13	18.190	+0.042
τ Bootis	4.51	13 44 10.336	2.8504	-0.0345	+17 46 48.30	17.972	+0.037
η Ursæ Majoris	1.91	13 44 58.833	2.3644	-0.0133	+49 38 13.99	17.988	-0.011
μ Centauri	3.32	13 45 41.498	3.6091	-0.0021	-42 09 02.23	17.974	-0.024
ζ Centauri	3.06	13 51 28.405	+3.7357	-0.0064	-46 58 08.36	-17.757	-0.038
η Bootis	2.80	13 51 35.302	2.8556	-0.0055	+18 43 22.21	18.076	-0.361
τ Virginis	4.34	13 58 20.144	3.0521	+0.0005	+1 51 30.27	17.448	-0.018
β Centauri	0.86	13 59 13.071	4.2226	-0.0036	-60 03 37.23	17.416	-0.023
α Draconis	3.64	14 02 37.621	1.6232	-0.0093	+64 41 09.65	17.229	+0.013
π Hydræ	3.48	14 02 39.797	+3.4132	+0.0023	-26 22 11.51	-17.374	-0.133
θ Centauri	2.26	14 02 50.961	3.5266	-0.0432	-36 03 03.59	17.752	-0.519
94 Virginis	6.56	14 02 51.020	3.1756	-0.0004	-8 34 55.10	17.201	+0.032
κ Virginis	4.31	14 09 25.449	3.1985	-0.0002	-9 58 19.14	16.792	+0.139
α Bootis*	0.24	14 12 41.698	2.7352	-0.0786	+19 31 12.38	18.772	-1.996
z Libræ	6.30	14 19 55.487	+3.2261	-0.0016	-11 25 04.96	-16.483	-0.061
f Bootis	5.36	14 23 25.842	2.7893	-0.0062	+19 31 05.84	16.222	+0.024
ρ Bootis	3.78	14 29 01.643	2.5846	-0.0089	+30 39 21.28	15.837	+0.117
γ Bootis	3.00	14 29 27.590	2.4150	-0.0107	+38 35 30.64	15.778	+0.153
η Centauri	2.65	14 31 22.217	3.8044	-0.0035	-41 52 23.94	15.855	-0.027
α Centauri* c.g.	0.06	14 35 10.066	+4.0658	-0.4910	-60 34 05.12	-14.899	+0.723
α Circini	3.42	14 37 13.832	4.8344	-0.0288	-64 41 36.98	15.754	-0.245
α Lupi	2.89	14 37 35.702	3.9831	-0.0029	-47 06 36.91	15.506	-0.017
α Apodis	3.81	14 39 41.668	7.3929	+0.0003	-78 46 15.97	15.400	-0.028
ε Bootis*	2.70	14 42 08.813	2.6190	-0.0048	+27 20 50.63	15.213	+0.020
α Libræ	2.90	14 47 16.668	+3.3168	-0.0079	-15 46 21.69	-15.004	-0.067
β Ursæ Minoris	2.24	14 50 52.373	-0.1873	-0.0089	+74 25 16.16	14.718	+0.008
ξ ² Libræ	5.63	14 53 14.211	+3.2535	-0.0001	-11 08 54.28	14.578	+0.007
β Lupi	2.81	14 54 15.849	3.9231	-0.0048	-42 52 23.81	14.563	-0.040
κ Centauri	3.35	14 54 55.387	3.8977	-0.0025	-41 50 40.27	14.506	-0.023
β Bootis	3.63	14 59 29.762	+2.2588	-0.0048	+40 38 46.14	-14.233	-0.29
σ Libræ*	3.41	15 00 15.568	3.5086	-0.0061	-25 01 39.57	14.202	-0.045
ψ Bootis	4.67	15 01 39.502	+2.5694	-0.0145	+27 12 00.53	-14.078	-0.008

12^a Canum Veneticorum. 5^m 39(12^a), 20°, 228°θ Virginis. 9^m, 7°, 343°ζ¹ Ursæ Majoris. 3^m 96 (ζ¹), 15°, 150°α Virginis. *Spica*α Bootis. *Archurus*α Centauri. 0^m 33-1^m 70, 4°, 286°ε Bootis. 5^m 12, 3°, 335°σ Libræ; formerly called γ
Scorpii

MEAN PLACES OF STARS, 1935

303

FOR JANUARY 1st 290

Star's Name	Mag.	Right Ascension	Annual Variation	Annual Proper Motion	Declination	Annual Variation	Annual Proper Motion
ζ Lupi	3.50	^{h m} 15 07 36.114	+4.3018	-0.0135	-51 51 11.63	-13.764	-0.068
ι Libræ	4.66	15 08 30.629	3.4170	-0.0037	-19 32 48.90	13.679	-0.042
γ Triang. Aust.	3.06	15 12 48.716	5.5833	-0.0111	-68 26 28.43	13.385	-0.026
δ Bootis	3.54	15 12 52.793	2.4171	+0.0051	+33 33 22.85	13.471	-0.117
β Libræ	2.74	15 13 30.304	3.2264	-0.0074	-9 08 39.18	13.332	-0.018
δ Lupi	3.43	15 17 05.849	+3.9342	-0.0011	-40 24 48.47	-13.098	-0.021
ο ^a Libræ	6.74	15 19 23.991	+3.3446	-0.0002	-14 54 11.57	12.906	+0.018
γ Ursæ Minoris	3.14	15 20 48.817	-0.1047	-0.0057	+72 03 55.00	12.814	+0.016
ι Draconis	3.47	15 23 28.727	+1.3322	-0.0024	+59 11 35.50	12.634	+0.015
32 Libræ	5.92	15 24 35.148	3.3814	+0.0003	-16 29 27.81	12.604	-0.030
γ Lupi* m.	2.95	15 30 48.041	+3.9932	-0.0022	-40 56 58.36	-12.167	-0.021
α Coronæ Bor.	2.31	15 31 56.025	2.5389	+0.0079	+26 55 56.66	12.159	-0.092
α Serpentis	2.75	15 41 03.814	2.9536	+0.0082	+6 37 44.21	11.372	+0.048
μ Serpentis	3.63	15 46 13.489	+3.1296	-0.0064	-3 13 57.34	11.073	-0.026
ζ Ursæ Minoris	4.34	15 46 20.126	-2.1679	+0.0044	+77 59 43.04	11.042	-0.004
ε Serpentis	3.75	15 47 34.389	+2.9894	+0.0078	+4 40 19.83	-10.883	+0.065
β Triang. Aust.	3.04	15 49 23.756	5.2746	-0.0288	-63 13 55.21	11.211	-0.397
γ Serpentis	3.86	15 53 26.883	2.7699	+0.0204	+15 52 21.21	11.800	-1.286
π Scorpil	3.00	15 54 54.840	3.6263	-0.0020	-25 55 41.97	10.427	-0.023
δ Scorpil	2.54	15 56 29.090	3.5449	-0.0017	-22 26 17.07	10.308	-0.021
β ¹ Scorpil*	2.90	16 01 39.182	+3.4864	-0.0010	-19 37 44.10	-9.914	-0.018
δ Ophiuchi	3.03	16 10 56.170	3.1425	-0.0037	-3 31 41.92	9.325	-0.142
ε Ophiuchi	3.34	16 14 52.736	3.1730	+0.0050	-4 32 07.38	8.831	+0.043
γ ^a Normæ	4.14	16 14 58.037	4.4842	-0.0169	-49 59 52.70	8.929	-0.061
σ Scorpil*	3.10	16 17 13.945	3.6439	-0.0018	-25 26 17.87	8.710	-0.020
γ Herculis	3.79	16 19 03.019	+2.6453	-0.0043	+19 18 16.46	-8.502	+0.044
η Draconis*	2.89	16 23 06.276	0.8091	-0.0044	+61 39 39.43	8.164	+0.060
γ Apodis	3.90	16 23 24.892	9.1623	-0.0435	-78 45 17.77	8.272	-0.073
α Scorpil*	1.22	16 25 25.049	3.6764	-0.0013	-26 17 21.35	8.058	-0.018
β Herculis	2.81	16 27 25.407	2.5779	-0.0079	+21 37 48.15	7.894	-0.016
λ Ophiuchi* m.	3.85	16 27 37.948	+3.0246	-0.0028	+2 07 29.86	-7.929	-0.068
τ Scorpil	2.91	16 31 49.874	3.7324	-0.0015	-28 04 57.79	7.543	-0.021
ζ Ophiuchi	2.70	16 33 34.591	3.3022	+0.0004	-10 26 12.80	7.353	+0.028
24 Scorpil	5.04	16 37 48.584	3.4680	-0.0023	-17 37 04.33	7.034	+0.001
ζ Herculis* c.g.	3.00	16 38 50.022	2.2602	-0.0381	+31 43 10.14	6.558	+0.392
η Herculis	3.61	16 40 39.905	+2.0553	+0.0018	+39 02 41.41	-6.888	-0.088
α Triang. Aust.	1.88	16 41 45.846	6.3422	+0.0042	-68 54 39.89	6.748	-0.037
ε Scorpil	2.36	16 45 56.944	3.8838	-0.0496	-34 10 36.66	6.612	-0.248
20 Ophiuchi	4.73	16 46 14.080	3.3174	+0.0056	-10 40 10.36	6.435	-0.094
μ ¹ Scorpil	3.09	16 47 27.726	4.0610	-0.0019	-37 56 15.20	6.264	-0.025
ζ Aræ	3.06	16 53 13.992	+4.9607	-0.0020	-55 53 22.23	-5.786	-0.029
κ Ophiuchi	3.42	16 54 35.359	2.8385	-0.0205	+9 28 29.16	5.650	-0.007
30 Ophiuchi	5.00	16 57 37.751	+3.1618	-0.0041	-4 07 35.33	-5.455	-0.068

γ Lupi. 3^m.6-3^m.8, 0^o.2, 290^o
 β¹ Scorpil. 5^m.06 (β^a), 14^o, 23^o
 α Scorpil. 8^m, 21^o, 272^o

η Draconis. 8^m, 5^o, 140^o
 α Scorpil. Antares. 7^m, 3^o,
 273^o

λ Ophiuchi. 4^m.0-6^m.1, 0^o.5,
 151^o
 ζ Herculis. 3^m.0-6^m.5,
 244^o

MEAN PLACES OF STARS, 1935

FOR JANUARY 1^d 290

Star's Name	Mag.	Right Ascension	Annual Variation	Annual Proper Motion	Declination	Annual Variation	Annual Proper Motion
ε Hercules	3.92	^h 16 ^m 57 ^s 48.009	+2.2938	-0.0050	+31° 01' 15.63	-5.346	+0.028
η Ophiuchi* m.	2.63	17 06 38.856	3.4393	+0.0022	-15 38 45.44	4.527	+0.097
ζ Scorpil	3.44	17 07 29.527	4.2936	+0.0005	-43 09 19.04	4.837	-0.285
η Draconis	3.22	17 08 35.575	0.1709	-0.0040	+65 47 40.51	4.436	+0.022
α ¹ Hercules*	Var.	17 11 40.900	2.7345	-0.0014	+14 27 47.44	4.156	+0.039
δ Hercules*	3.16	17 12 21.571	+2.4629	-0.0028	+24 54 52.53	-4.297	-0.160
π Hercules	3.36	17 12 46.851	2.0882	-0.0033	+36 52 52.87	4.098	+0.002
θ Ophiuchi	3.37	17 18 00.885	3.6831	-0.0008	-24 56 10.56	3.669	-0.018
β Aræ	2.80	17 19 53.457	4.9840	-0.0015	-55 28 14.30	3.519	-0.029
σ Ophiuchi	4.44	17 23 17.231	2.9755	-0.0008	+4 11 43.82	3.184	+0.013
ν Scorpil	2.80	17 26 20.531	+4.0782	+0.0002	-37 14 44.47	-2.961	-0.028
α Aræ	2.97	17 26 48.790	4.6358	-0.0034	-49 49 35.74	2.961	-0.069
β Draconis	2.99	17 28 57.691	1.3542	-0.0027	+52 20 55.82	2.692	+0.014
λ Scorpil	1.71	17 29 11.509	4.0721	-0.0008	-37 03 29.31	2.710	-0.024
α Ophiuchi	2.14	17 31 54.913	2.7836	+0.0072	+12 36 21.69	2.674	-0.225
θ Scorpil	2.04	17 32 38.682	+4.3087	+0.0003	-42 57 29.81	-2.386	+0.001
κ Scorpil	2.51	17 37 59.287	4.1483	-0.0017	-38 59 53.93	1.948	-0.026
η Pavonis	3.58	17 39 20.947	5.8868	-0.0010	-64 41 43.10	1.858	-0.055
β Ophiuchi	2.94	17 40 15.574	2.9625	-0.0036	+4 35 35.00	1.561	+0.164
ι ¹ Scorpil	3.14	17 43 02.154	4.1945	-0.0008	-40 06 12.92	1.481	+0.001
μ Hercules	3.48	17 43 54.747	+2.3470	-0.0244	+27 45 27.58	-2.145	-0.739
G Scorpil	3.25	17 45 25.999	4.0849	+0.0061	-37 01 27.76	1.242	+0.031
89 Hercules	5.48	17 52 47.706	2.4188	-0.0010	+26 03 33.27	0.618	+0.012
γ Draconis	2.42	17 55 05.667	1.3914	-0.0023	+51 29 45.12	0.447	-0.018
ν Ophiuchi	3.50	17 55 26.803	3.3020	-0.0009	-9 46 01.80	0.513	-0.115
γ Sagittarii	3.07	18 01 37.882	+3.8536	-0.0042	-30 25 35.73	-0.044	-0.186
72 Ophiuchi	3.73	18 04 16.000	2.8437	-0.0045	+9 33 11.87	+0.460	+0.087
μ Sagittarii	4.01	18 09 52.503	3.5872	-0.0003	-21 04 39.00	0.865	+0.002
η Sagittarii*	3.16	18 13 13.687	4.0587	-0.0117	-36 46 58.63	0.996	-0.160
δ Sagittarii	2.84	18 16 49.927	3.8402	+0.0022	-29 51 26.66	1.448	-0.023
η Serpentis	3.42	18 17 56.708	+3.1035	-0.0375	-2 55 01.63	+0.876	-0.692
ε Sagittarii	1.95	18 19 51.455	3.9818	-0.0033	-34 25 01.70	1.611	-0.124
α Telescopii	3.76	18 22 09.282	+4.4495	-0.0011	-46 00 22.00	1.889	-0.045
χ Draconis	3.69	18 22 13.737	-1.0822	+0.1162	+72 42 18.50	1.580	-0.361
λ Sagittarii	2.94	18 23 57.518	+3.7018	-0.0039	-25 27 33.19	1.912	-0.179
α Lyrae*	0.14	18 34 44.181	+2.0303	+0.0164	+38 43 19.69	+3.310	+0.284
ζ Pavonis	4.10	18 35 27.110	7.0168	+0.0009	-71 29 13.20	2.922	-0.166
4 H Scuti	4.74	18 38 42.840	3.2847	+0.0003	-9 06 58.23	3.374	+0.004
φ Sagittarii	3.30	18 41 35.734	3.7477	+0.0034	-27 03 33.24	3.622	+0.004
λ Pavonis	4.42	18 46 12.001	5.5616	-0.0013	-62 15 52.12	3.996	-0.017
30 Sagittarii	6.24	18 46 55.996	+3.6049	-0.0031	-22 14 17.43	+4.043	-0.033
β Lyrae*	Var.	18 47 40.701	2.2138	-0.0008	+33 17 10.10	4.138	-0.001
σ Sagittarii	2.14	18 51 14.125	+3.7198	+0.0006	-26 22 44.53	+4.395	-0.049
η Ophiuchi. 3 ^m . 2-3 ^m . 7, 0° 6', 235°							
α ¹ Hercules. 3 ^m . 1 to 3 ^m . 9. 5 ^m . 39							
(α ²), 5°, 111°							
δ Hercules. 8 ^m . 10°, 210°							
η Sagittarii. 9 ^m . 4°, 104°							
α Lyrae. Vega							
β Lyrae. 3 ^m . 4 to 4 ^m . 1. 7 ^m , 46°, 149°							

MEAN PLACES OF STARS, 1935

305

FOR JANUARY 1^d 290

Star's Name	Mag.	Right Ascension	Annual Variation	Annual Proper Motion	Declination	Annual Variation	Annual Proper Motion
ξ Sagittarii	3.61	18 ^h 53 ^m 51 ^s .127	+3.5786	+0.0017	-21° 11' 37".23	+4.656	-0.011
γ Lyrae	3.30	18 56 30.622	2.2430	-0.0013	+32 35 57.49	4.894	+ .002
ε Aquilæ	4.21	18 56 40.255	2.7219	-0.0045	+14 58 43.57	4.837	- .069
ζ Sagittarii* m.	2.71	18 58 28.608	3.8165	-0.0022	-29 58 29.09	5.060	+ .001
ζ Aquilæ	3.02	19 02 25.283	2.7565	-0.0012	+13 45 56.11	5.300	- .091
λ Aquilæ	3.55	19 02 47.927	+3.1830	-0.0021	- 4 58 53.20	+ 5.338	-0.085
τ Sagittarii	3.42	19 02 52.957	3.7453	-0.0049	-27 46 01.47	5.181	- .249
α Coronæ Aust.	4.12	19 05 03.127	4.0821	+0.0066	-38 00 26.86	5.514	- .099
π Sagittarii	3.02	19 05 53.940	3.5679	-0.0003	-21 07 42.77	5.650	- .035
ψ Sagittarii	4.93	19 11 33.362	3.6790	+0.0030	-25 22 12.94	6.135	- .022
δ Draconis	3.24	19 12 32.648	+0.0159	+0.0159	+67 32 50.00	+ 6.332	+0.093
ω Aquilæ	5.14	19 14 45.849	2.8152	-0.0008	+11 28 37.03	6.444	+ .020
δ Aquilæ	3.44	19 22 13.233	3.0244	+0.0166	+ 2 59 01.89	7.126	+ .088
59 G Telescopii	5.58	19 22 35.378	4.8262	+0.0030	-54 27 25.53	7.062	- .006
6 Vulpeculæ	4.63	19 25 59.937	2.4953	-0.0102	+24 31 55.62	7.240	- .105
β ¹ Cygni*	3.24	19 28 05.912	+2.4185	-0.0008	+27 49 19.18	+ 7.512	-0.004
μ Aquilæ	4.65	19 30 54.775	2.9299	+0.0135	+ 7 14 22.91	7.595	- .149
h Sagittarii	4.66	19 32 45.215	3.6515	+0.0050	-25 01 42.69	7.878	- .015
54 Sagittarii	5.45	19 37 00.029	3.4372	+0.0047	-16 26 36.84	8.197	- .035
f Sagittarii	5.06	19 42 34.310	3.4999	-0.0096	-19 55 07.64	8.593	- .081
δ Cygni*	2.98	19 42 56.516	+1.8741	+0.0036	+44 58 16.61	+ 8.751	+0.048
γ Aquilæ	2.80	19 43 10.124	2.8515	+0.0005	+10 27 13.24	8.727	+ .006
α Aquilæ*	0.89	19 47 36.680	+2.9263	+0.0356	+ 8 41 43.74	9.462	+ .393
ε Draconis*	4.03	19 48 24.080	-0.1991	+0.0144	+70 06 08.91	9.168	+ .037
ι Sagittarii	4.21	19 50 46.934	+4.1415	+0.0016	-42 02 26.17	9.379	+ .063
β Aquilæ	3.90	19 52 07.183	+2.9462	+0.0023	+ 6 14 35.47	+ 8.945	-0.475
ε Pavonis	4.10	19 53 06.470	6.9596	+0.0170	-73 05 06.04	9.346	- .149
g Sagittarii	5.05	19 54 15.908	3.4029	+0.0007	-15 39 55.04	9.491	- .093
c Sagittarii	4.60	19 58 39.842	3.6899	+0.0024	-27 53 30.95	9.945	+0.025
δ Pavonis	3.64	20 02 22.097	5.8975	+0.1979	-66 21 00.11	9.054	-1.146
θ Aquilæ	3.37	20 07 57.073	+3.0950	+0.0019	- 1 00 55.81	+10.629	+0.011
4 Capricorni	5.96	20 14 12.403	3.5257	+0.0025	-22 00 43.93	11.046	- .032
α ² Capricorni	3.77	20 14 26.963	3.3287	+0.0040	-12 44 51.37	11.106	+ .010
β Capricorni	3.25	20 17 21.658	3.3710	+0.0026	-14 59 16.61	11.314	+ .007
γ Cygni	2.32	20 19 53.647	2.1525	-0.0002	+40 02 51.62	11.488	- .001
α Pavonis	2.12	20 20 31.040	+4.7530	+0.0007	-56 56 42.17	+11.452	-0.081
ρ Capricorni*	5.06	20 25 09.270	3.4221	-0.0014	-18 01 47.09	11.850	- .013
ε Delphini	3.98	20 30 06.405	2.8655	-0.0000	+11 04 52.72	12.196	- .014
α Indi	3.21	20 33 00.237	4.2246	+0.0056	-47 31 10.27	12.485	+ .076
α Delphini	3.86	20 36 37.074	2.7860	+0.0039	+15 40 54.39	12.662	+ .006
β Pavonis	3.60	20 39 07.507	+5.4214	-0.0064	-66 26 18.47	+12.848	+0.023
α Cygni*	1.33	20 39 12.846	2.0439	-0.0008	+45 02 50.22	12.836	+ .005
ε Cygni	2.64	20 43 34.744	+2.4263	+0.0276	+33 43 33.09	+13.452	+0.330

ζ Sagittarii. 3^m.4-3^m.6, 0° 6.242° α Aquilæ. Altair

β¹ Cygni. 5^m.36 (β³), 35°, 54° ε Draconis. 8^m, 3° 0, 10°

ρ Capricorni. 7^m.5, 2° 0, 167°
α Cygni. Deneb

MEAN PLACES OF STARS, 1935

FOR JANUARY 1^d 290

Star's Name	Mag.	Right Ascension	Annual Variation	Annual Proper Motion	Declination	Annual Variation	Annual Proper Motion
η Cephei	3.59	20 43 58.192	+1.2212	+0.0125	+61 35 09.27	+13.971	+0.823
ϵ Aquarii	3.83	20 44 09.509	3.2478	+0.0019	-9 44 05.40	13.133	-0.027
μ Aquarii	4.80	20 49 08.947	3.2361	+0.0025	-9 13 41.79	13.464	-0.022
β Vulpeculae	5.24	20 51 47.262	2.5561	-0.0010	+27 48 34.25	13.661	+0.004
γ Microscopii	4.71	20 57 18.542	3.6825	+0.0002	-32 30 46.93	14.011	+0.005
θ Capricorni	4.19	21 02 17.738	+3.3733	+0.0056	-17 29 31.84	+14.263	-0.052
61 ¹ Cygni*	5.57	21 03 58.880	2.6896	+0.3532	+38 25 43.83	17.675	+3.258
ζ Cygni	3.40	21 10 10.055	2.5521	-0.0009	+29 57 34.20	14.737	-0.050
α Equulei	4.14	21 12 34.468	2.9988	+0.0035	+4 58 41.47	14.849	-0.080
θ Microscopii	4.92	21 16 36.615	3.8419	+0.0069	-41 05 07.61	15.160	-0.002
α Cephei	2.60	21 17 01.683	+1.4315	+0.0204	+62 18 35.00	+15.237	+0.051
ι Capricorni	4.30	21 18 37.791	3.3414	+0.0021	-17 06 44.56	15.287	+0.010
γ Pavonis	4.30	21 21 05.704	4.9766	+0.0155	-65 39 42.59	16.212	+0.796
ζ Capricorni	3.86	21 22 57.561	3.4264	-0.0002	-22 41 37.71	15.551	+0.031
β Cephei*	3.33	21 27 49.704	0.7777	+0.0014	+70 16 30.96	15.799	+0.014
β Aquarii	3.07	21 28 08.280	+3.1582	+0.0009	-5 51 28.73	+15.804	+0.001
ξ Aquarii	4.78	21 34 17.559	3.1940	+0.0074	-8 08 47.68	16.110	-0.018
ϵ Pegasi	2.54	21 40 59.554	2.9458	+0.0013	+9 34 34.51	16.479	+0.010
δ Capricorni	2.98	21 43 27.331	3.1120	+0.0179	-16 25 22.84	16.305	-0.286
γ Gruis	3.16	21 49 59.960	3.6357	+0.0084	-37 40 16.75	16.899	-0.006
16 Pegasi	5.05	21 50 06.072	+2.7270	-0.0019	+25 37 06.96	+16.914	+0.004
α Aquarii	3.19	22 02 26.739	3.0812	+0.0009	-0 38 10.59	17.465	+0.001
ι Pegasi	3.96	22 03 58.918	2.7913	+0.0209	+25 01 37.26	17.562	+0.032
α Gruis	2.16	22 04 08.742	3.7857	+0.0120	-47 16 35.20	17.397	-0.140
ζ Cephei	3.62	22 08 35.718	2.0797	+0.0011	+57 52 49.87	17.739	+0.017
θ Aquarii	4.32	22 13 24.282	+3.1660	+0.0076	-8 06 27.24	+17.902	-0.013
α Tucanae	2.91	22 14 03.973	4.1210	-0.0088	-60 35 03.46	17.908	-0.032
γ Aquarii	3.97	22 18 17.952	3.0986	+0.0084	-1 42 55.44	18.122	+0.019
σ Aquarii	4.89	22 27 12.516	3.1752	-0.0002	-11 00 40.12	18.400	-0.023
η Aquarii	4.13	22 32 00.969	3.0825	+0.0056	-0 27 10.83	18.539	-0.046
κ Aquarii	5.33	22 34 23.437	+3.1073	-0.0046	-4 33 49.81	+18.549	-0.013
ζ Pegasi	3.61	22 38 13.111	2.9913	+0.0047	+10 29 29.89	18.779	-0.002
β Gruis	2.24	22 38 47.720	3.5878	+0.0137	-47 13 30.08	18.796	-0.003
η Pegasi	3.10	22 39 57.071	2.8104	+0.0002	+29 52 51.12	18.814	-0.019
ϵ Gruis	3.69	22 44 38.322	3.6298	+0.0112	-51 39 32.66	18.915	-0.055
μ Pegasi	3.67	22 46 51.747	+2.8940	+0.0100	+24 15 28.73	+18.997	-0.035
ι Cephei	3.68	22 47 21.631	2.1329	-0.0108	+65 51 29.96	18.929	-0.117
λ Aquarii	3.84	22 49 13.432	3.1296	+0.0001	-7 55 33.14	19.140	+0.044
δ Aquarii	3.51	22 51 12.165	3.1847	-0.0028	-16 10 00.90	19.130	-0.018
α Piscis Aust.*	1.29	22 54 03.777	3.3165	+0.0249	-29 58 01.61	19.061	-0.159
β Piscium	4.58	23 00 34.066	+3.0523	+0.0001	+3 28 11.27	+19.374	0.000
β Pegasi	2.61	23 00 37.135	2.9064	+0.0134	+27 43 47.85	19.522	+0.147
α Pegasi*	2.57	23 01 31.230	+2.9871	+0.0036	+14 51 18.76	+19.360	-0.035

61¹ Cygni. 6^m-28 (61¹), 25°, 136° β Cephei. 8^m, 14°, 249° α Piscis Australis. Fomalhaut α Pegasi. Markab

MEAN PLACES OF STARS, 1935

307

FOR JANUARY 1st 290

Star's Name	Mag.	Right Ascension	Annual Variation	Annual Proper Motion	Declination	Annual Variation	Annual Proper Motion
ϵ^2 Aquarii	3.80	^h 23 ^m 05 ^s 59.012	+3.1999	+0.0039	-21 31 31.75	+19.531	+0.041
γ Tucanæ	4.10	23 13 38.927	3.5091	-0.0035	-58 35 32.19	19.730	+0.094
γ Piscium	3.85	23 13 47.685	3.1096	+0.0503	+2 55 36.99	19.667	+0.029
ψ^3 Aquarii	5.16	23 15 34.836	3.1207	+0.0025	-9 57 58.37	19.681	+0.012
τ Pegasi	4.65	23 17 24.945	2.9674	+0.0012	+23 23 03.77	19.698	-0.001
κ Piscium	4.94	23 23 35.959	+3.0749	+0.0053	+0 53 58.61	+19.705	-0.086
72 Pegasi* <i>m.</i>	5.21	23 30 43.383	2.9742	+0.0034	+30 57 59.14	19.870	-0.011
ι Phœnicis	4.80	23 31 35.141	3.2315	+0.0045	-42 58 28.57	19.897	+0.007
ι Piscium	4.28	23 36 36.321	3.0850	+0.0246	+5 16 26.13	19.512	-0.428
γ Cephei	3.42	23 36 39.566	2.4497	-0.0219	+77 16 10.19	20.093	+0.153
λ Piscium	4.61	23 38 43.713	+3.0606	-0.0093	+1 25 20.36	+19.816	-0.141
δ Sculptoris	4.64	23 45 32.591	3.1264	+0.0077	-28 29 22.87	19.910	-0.094
ϕ Pegasi	5.23	23 49 10.652	3.0509	-0.0006	+18 45 33.68	19.994	-0.027
27 Piscium	5.07	23 55 20.692	3.0713	-0.0036	-3 54 59.67	19.974	-0.066
ω Piscium	4.03	23 55 58.284	+3.0800	+0.0097	+6 30 12.64	+19.936	-0.105

CIRCUMPOLAR STARS

α Octantis	7.22	^h 0 ^m 12 ^s 15.72	-0.116	+0.020	-88 43 27.72	+20.019	+0.004
α Ursæ Minoris*	2.12	1 39 40.27	+34.079	+0.177	+88 57 13.71	+18.176	-0.002
9 B Octantis	7.76	2 30 14.91	-8.604	-0.002	-86 00 31.31	+15.870	-0.019
10 B Octantis	8.35	2 45 06.05	-29.149	-0.031	-88 25 53.19	+15.042	-0.022
31 G Mensæ	6.24	5 42 45.19	-11.639	-0.006	-84 49 22.86	+1.556	+0.049
12 B Octantis	6.74	5 56 58.66	-15.740	-0.023	-85 55 57.54	+0.268	+0.004
51 H Cephei	5.26	7 10 44.92	+28.625	-0.048	+87 09 10.75	-6.126	-0.036
λ Octantis	7.75	7 25 32.09	-49.969	-0.031	-88 39 19.42	-7.295	+0.013
4 B Ursæ Min.	7.01	8 32 55.86	+54.209	-0.011	+88 49 27.65	-12.392	+0.012
10 G Octantis	6.74	10 35 01.68	-3.451	-0.002	-85 45 15.75	-18.679	+0.003
η Octantis	6.26	10 59 48.93	-0.415	-0.046	-84 14 39.20	-19.364	-0.007
6 B Ursæ Min.	6.28	12 14 36.85	+0.499	-0.059	+88 03 36.77	-19.950	+0.053
δ Octantis	4.14	14 16 16.11	+9.460	-0.055	-83 22 21.27	-16.615	-0.011
57 B Ursæ Min.	7.16	14 58 01.45	-18.256	-0.026	+87 28 56.35	-14.272	+0.023
ρ Octantis	5.66	15 28 00.08	+13.631	+0.094	-84 15 13.03	-12.250	+0.090
ϵ Ursæ Minoris	4.40	16 52 33.42	-6.193	+0.006	+82 08 49.60	-5.811	+0.002
δ Ursæ Minoris	4.44	17 53 10.28	-19.481	+0.013	+86 36 45.96	-0.546	+0.051
λ Ursæ Minoris	6.55	18 40 29.64	-75.514	-0.109	+89 02 22.93	+3.528	+0.005
44 G Octantis	6.32	19 44 09.76	+11.131	+0.008	-81 31 01.59	+8.803	+0.004
σ Octantis	5.48	19 54 45.37	+85.272	+0.121	-89 10 54.39	+9.619	-0.002
48 G Octantis	7.08	20 27 25.07	+14.500	+0.046	-84 37 59.49	+12.008	-0.014
Groomb. 3548	7.36	21 12 31.16	-12.724	+0.011	+86 46 14.73	+14.940	+0.014
ν Octantis	5.74	22 19 45.75	+11.790	-0.036	-86 18 00.65	+18.226	+0.069
β Octantis	4.34	22 39 32.04	+6.206	-0.026	-81 43 23.67	+18.828	+0.007
39 H Cephei	5.62	23 27 40.17	-0.355	+0.097	+86 56 56.34	+19.865	+0.020

72 Pegasi. 6^m.0 - 6^m.0, 0^s.4, 200°

α Ursæ Minoris. *Polaris*, 8^m.8 18°, 216°

AT UPPER TRANSIT AT GREENWICH

 α Ursæ Minoris (*Polaris*) Mag. 2.12

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁ 39 ^m 88 ^s 57 [.]	+	^h ₁ 38 ^m 88 ^s 57 [.]	+	^h ₁ 38 ^m 88 ^s 57 [.]	+	^h ₁ 38 ^m 88 ^s 57 [.]	+	^h ₁ 38 ^m 88 ^s 57 [.]	+	^h ₁ 39 ^m 88 ^s 57 [.]	+
1	55.47	40.49	80.61	42.01	52.29	38.09	35.18	29.73	38.98	20.49	02.33	13.18
2	54.56	40.65	79.40	41.99	51.35	37.91	34.90	29.40	39.57	20.18	03.42	13.03
3	53.60	40.82	78.14	41.96	50.38	37.71	34.72	29.05	40.22	19.89	04.45	12.90
4	52.57	40.99	76.84	41.90	49.43	37.48	34.66	28.71	40.90	19.61	05.42	12.78
5	51.45	41.17	75.57	41.82	48.54	37.23	34.69	28.38	41.57	19.35	06.35	12.65
6	50.25	41.34	74.36	41.71	47.73	36.96	34.76	28.06	42.19	19.10	07.25	12.50
7	48.98	41.48	73.24	41.58	47.03	36.68	34.84	27.75	42.76	18.86	08.14	12.35
8	47.69	41.59	72.22	41.44	46.43	36.40	34.89	27.47	43.28	18.62	09.05	12.20
9	46.43	41.67	71.27	41.31	45.89	36.14	34.90	27.20	43.77	18.38	10.01	12.05
10	45.23	41.73	70.36	41.19	45.38	35.89	34.86	26.92	44.24	18.13	11.02	11.89
11	44.12	41.77	69.45	41.08	44.87	35.65	34.79	26.63	44.73	17.87	12.10	11.73
12	43.08	41.81	68.52	40.97	44.32	35.42	34.69	26.33	45.26	17.60	13.25	11.57
13	42.09	41.85	67.53	40.87	43.71	35.19	34.59	26.01	45.84	17.31	14.46	11.42
14	41.12	41.90	66.48	40.77	43.05	34.95	34.52	25.68	46.48	17.02	15.72	11.30
15	40.13	41.96	65.38	40.66	42.37	34.70	34.50	25.35	47.21	16.74	16.99	11.21
16	39.08	42.04	64.25	40.53	41.67	34.43	34.54	25.02	48.01	16.47	18.26	11.14
17	37.96	42.11	63.10	40.38	40.98	34.15	34.66	24.68	48.88	16.21	19.49	11.08
18	36.77	42.18	61.95	40.22	40.31	33.86	34.87	24.34	49.80	15.97	20.64	11.04
19	35.52	42.23	60.84	40.04	39.70	33.55	35.15	24.00	50.73	15.74	21.72	11.00
20	34.23	42.27	59.78	39.84	39.16	33.23	35.49	23.68	51.64	15.54	22.75	10.95
21	32.93	42.30	58.78	39.63	38.70	32.89	35.88	23.38	52.50	15.36	23.75	10.88
22	31.63	42.31	57.86	39.41	38.33	32.56	36.28	23.09	53.30	15.18	24.77	10.79
23	30.35	42.30	57.02	39.18	38.03	32.25	36.64	22.82	54.04	15.00	25.85	10.70
24	29.12	42.27	56.24	38.97	37.78	31.95	36.95	22.56	54.73	14.81	27.01	10.60
25	27.94	42.22	55.49	38.78	37.56	31.66	37.21	22.30	55.43	14.61	28.27	10.50
26	26.83	42.17	54.76	38.60	37.34	31.39	37.42	22.03	56.17	14.40	29.61	10.42
27	25.78	42.12	54.00	38.43	37.08	31.13	37.60	21.74	56.99	14.17	30.99	10.36
28	24.78	42.07	53.18	38.26	36.75	30.87	37.81	21.44	57.93	13.94	32.37	10.33
29	23.80	42.04	52.29	38.09	36.37	30.61	38.09	21.13	58.96	13.73	33.72	10.32
30	22.80	42.03			35.96	30.33	38.48	20.81	60.06	13.53	35.01	10.33
31	21.74	42.02			35.55	30.04	38.98	20.49	61.20	13.35	36.22	10.35
32	20.61	42.01			35.18	29.73			62.33	13.18		

Mean R.A. 1^h 39^m 40^s.27 Mean Dec. +88° 57' 13".71 Sec δ 54.77 Tan δ +54.76

APPARENT PLACES OF STARS, 1935

309

AT UPPER TRANSIT AT GREENWICH

α Ursæ Minoris (*Polaris*) Mag. 2.12

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁ ^m ₃₉ ^s ₈₈ ^s ₅₇	+	^h ₁ ^m ₄₀ ^s ₈₈ ^s ₅₇	+	^h ₁ ^m ₄₀ ^s ₈₈ ^s ₅₇	+	^h ₁ ^m ₄₁ ^s ₈₈ ^s ₅₇	+	^h ₁ ^m ₄₁ ^s ₈₈ ^s ₅₇	+	^h ₁ ^m ₄₀ ^s ₈₈ ^s ₅₇	+
1	36.22	10.35	14.28	12.43	48.08	19.11	10.85	28.82	18.99	40.89	68.23	51.32
2	37.38	10.37	15.35	12.57	49.07	19.35	11.51	29.17	18.85	41.30	67.43	51.62
3	38.49	10.38	16.46	12.70	50.10	19.61	12.14	29.54	18.63	41.69	66.64	51.90
4	39.58	10.38	17.61	12.83	51.15	19.89	12.73	29.93	18.35	42.07	65.90	52.17
5	40.67	10.37	18.81	12.96	52.21	20.18	13.24	30.33	18.07	42.43	65.24	52.43
6	41.79	10.36	20.06	13.11	53.24	20.49	13.66	30.73	17.81	42.77	64.64	52.68
7	42.95	10.35	21.35	13.27	54.21	20.81	13.99	31.14	17.62	43.10	64.07	52.94
8	44.17	10.33	22.67	13.44	55.10	21.15	14.26	31.53	17.51	43.43	63.51	53.22
9	45.45	10.31	23.98	13.62	55.90	21.49	14.49	31.91	17.44	43.77	62.91	53.51
10	46.79	10.31	25.26	13.83	56.63	21.84	14.73	32.27	17.38	44.13	62.24	53.81
11	48.17	10.33	26.48	14.06	57.30	22.17	15.02	32.61	17.32	44.50	61.47	54.11
12	49.57	10.37	27.62	14.30	57.95	22.49	15.38	32.95	17.20	44.88	60.61	54.39
13	50.96	10.43	28.67	14.53	58.65	22.79	15.81	33.30	16.98	45.28	59.68	54.67
14	52.31	10.51	29.66	14.76	59.41	23.08	16.27	33.66	16.67	45.67	58.70	54.94
15	53.61	10.60	30.62	14.98	60.24	23.37	16.75	34.03	16.27	46.06	57.70	55.18
16	54.83	10.70	31.60	15.19	61.13	23.67	17.19	34.42	15.80	46.43	56.71	55.40
17	55.97	10.80	32.62	15.39	62.05	23.98	^{17.56} _{17.83}	^{34.83} _{35.23}	15.29	46.78	55.74	55.60
18	57.06	10.89	33.71	15.58	62.96	24.31	18.01	35.66	14.76	47.11	54.81	55.79
19	58.14	10.97	34.88	15.77	63.83	24.66	18.10	36.07	14.25	47.43	53.92	55.97
20	59.26	11.03	36.11	15.97	64.62	25.03	18.14	36.46	13.76	47.74	53.06	56.15
21	60.45	11.09	37.36	16.20	65.31	25.41	18.15	36.84	13.30	48.04	52.23	56.34
22	61.73	11.14	38.59	16.45	65.92	25.78	18.16	37.20	12.88	48.34	51.41	56.54
23	63.08	11.20	39.76	16.72	66.46	26.15	18.18	37.55	12.49	48.65	50.59	56.75
24	64.49	11.28	40.85	16.99	66.96	26.51	18.23	37.90	12.12	48.96	49.73	56.96
25	65.90	11.38	41.86	17.27	67.44	26.85	18.32	38.24	11.74	49.28	48.80	57.18
26	67.28	11.51	42.79	17.56	67.93	27.18	18.44	38.58	11.34	49.61	47.79	57.40
27	68.61	11.67	43.67	17.85	68.44	27.51	18.58	38.93	10.89	49.95	46.70	57.61
28	69.86	11.84	44.52	18.12	68.99	27.84	18.74	39.29	10.36	50.31	45.54	57.81
29	71.03	12.00	45.37	18.38	69.58	28.16	18.89	39.67	09.73	50.66	44.35	57.99
30	72.14	12.15	46.24	18.63	70.20	28.49	19.00	40.06	09.01	51.00	43.16	58.15
31	73.22	12.29	47.14	18.87	70.85	28.82	19.04	40.47	08.23	51.32	42.02	58.28
32	74.28	12.43	48.08	19.11			18.99	40.89			40.94	58.39

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

51 H Cephei Mag. 5.26

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s 7 11 87 09	^h ^m ^s + 87 09	^h ^m ^s 7 11 87 09	^h ^m ^s + 87 09	^h ^m ^s 7 11 87 09	^h ^m ^s + 87 09	^h ^m ^s 7 10 87 09	^h ^m ^s + 87 09	^h ^m ^s 7 10 87 09	^h ^m ^s + 87 09	^h ^m ^s 7 10 87 09	^h ^m ^s + 87 09
1	22.04	09.96	23.03	19.72	16.75	26.82	64.98	30.43	52.97	28.38	44.52	21.38
2	22.21	10.23	22.98	20.05	16.48	27.05	64.51	30.46	52.59	28.19	44.40	21.08
3	22.40	10.49	22.89	20.39	16.17	27.29	64.04	30.46	52.24	27.98	44.30	20.80
4	22.61	10.77	22.75	20.73	15.82	27.52	63.58	30.44	51.92	27.77	44.19	20.53
5	22.82	11.07	22.57	21.06	15.43	27.73	63.15	30.40	51.62	27.57	44.07	20.27
6	23.02	11.39	22.36	21.36	15.02	27.91	62.74	30.34	51.34	27.39	43.93	20.02
7	23.19	11.73	22.13	21.63	14.62	28.05	62.36	30.28	51.07	27.22	43.78	19.76
8	23.32	12.09	21.91	21.88	14.23	28.17	62.00	30.24	50.79	27.06	43.62	19.50
9	^h ^m ^s 23.41 23.45	^h ^m ^s 12.45 12.45	21.70	22.12	13.86	28.29	61.64	30.21	50.49	26.91	43.45	19.23
10	23.47	13.12	21.51	22.35	13.51	28.40	61.28	30.20	50.18	26.75	43.27	18.94
11	23.48	13.41	21.34	22.58	13.18	28.51	60.90	30.20	49.85	26.59	43.10	18.63
12	23.50	13.69	21.18	22.82	12.86	28.63	60.50	30.19	49.50	26.42	42.94	18.30
13	23.54	13.96	21.02	23.07	12.54	28.77	60.08	30.18	49.15	26.23	42.81	17.96
14	23.59	14.22	20.85	23.34	12.21	28.92	59.65	30.16	48.80	26.02	42.72	17.62
15	23.66	14.49	20.66	23.64	11.86	29.08	59.20	30.13	48.46	25.79	42.67	17.27
16	23.73	14.79	20.45	23.92	11.48	29.24	58.75	30.07	48.13	25.54	42.65	16.93
17	23.80	15.11	20.21	24.21	11.08	29.40	58.29	29.99	47.83	25.27	42.65	16.60
18	23.86	15.44	19.94	24.50	10.66	29.54	57.84	29.90	47.57	25.00	42.66	16.29
19	23.89	15.78	19.64	24.78	10.22	29.66	57.41	29.79	47.34	24.73	42.66	16.00
20	23.89	16.13	19.32	25.03	09.76	29.76	57.01	29.66	47.13	24.47	42.65	15.73
21	23.87	16.48	18.99	25.26	09.30	29.84	56.63	29.53	46.94	24.24	42.61	15.46
22	23.82	16.83	18.66	25.47	08.85	29.90	56.28	29.40	46.76	24.03	42.55	15.18
23	23.74	17.17	18.34	25.67	08.42	29.94	55.96	29.28	46.57	23.82	42.48	14.88
24	23.63	17.49	18.03	25.85	08.01	29.97	55.65	29.17	46.36	23.61	42.41	14.55
25	23.51	17.79	17.74	26.02	07.63	30.00	55.33	29.08	46.12	23.39	42.35	14.20
26	23.40	18.08	17.48	26.20	07.28	30.04	54.99	29.00	45.85	23.15	42.32	13.83
27	23.30	18.35	17.24	26.39	06.94	30.09	54.62	28.91	45.57	22.89	42.32	13.46
28	23.21	18.60	17.00	26.60	06.60	30.15	54.22	28.81	45.30	22.61	42.36	13.10
29	23.14	18.85	16.75	26.82	06.24	30.23	53.80	28.69	45.06	22.31	42.43	12.75
30	23.09	19.12			05.85	30.31	53.38	28.55	44.85	22.00	42.52	12.41
31	23.06	19.41			05.43	30.38	52.97	28.38	44.67	21.69	42.61	12.09
32	23.03	19.72			04.98	30.43			44.52	21.38		

Mean R.A. 7^h 10^m 44^s.92 Mean Dec. +87° 09' 10".75 Sec δ 20.13 Tan δ +20.11

APPARENT PLACES OF STARS, 1935

311

AT UPPER TRANSIT AT GREENWICH

51 H Cephei Mag. 5.26

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 7	^m 10	^h 7	^m 10	^h 7	^m 10	^h 7	^m 11	^h 7	^m 11	^h 7	^m 11
	^s 87	^s 09	^s 87	^s 08	^s 87	^s 08	^s 87	^s 08	^s 87	^s 08	^s 87	^s 08
1	42.61	12.09	47.43	62.31	58.02	54.20	12.18	49.40	28.34	48.73	42.18	52.74
2	42.70	11.79	47.65	62.04	58.40	53.97	12.69	49.27	28.91	48.81	42.58	53.00
3	42.78	11.51	47.86	61.76	58.80	53.73	13.23	49.14	29.46	48.91	42.95	53.25
4	42.83	11.23	48.07	61.47	59.22	53.48	13.79	49.05	29.99	49.02	43.28	53.48
5	42.86	10.94	48.29	61.17	59.67	53.23	14.37	48.97	30.49	49.13	43.58	53.70
6	42.89	10.63	48.54	60.85	60.15	53.00	14.95	48.91	30.96	49.25	43.89	53.91
7	42.92	10.31	48.81	60.52	60.65	52.79	15.52	48.88	31.40	49.36	44.21	54.10
8	42.95	09.97	49.10	60.19	61.17	52.60	16.06	48.86	31.82	49.45	44.55	54.28
9	42.99	09.64	49.43	59.87	61.68	52.44	16.57	48.85	32.25	49.52	44.91	54.46
10	43.06	09.28	49.79	59.56	62.18	52.30	17.05	48.83	32.71	49.57	45.29	54.65
11	43.16	08.91	50.17	59.27	62.65	52.16	17.51	48.80	33.20	49.62	45.69	54.87
12	43.29	08.55	50.56	59.01	63.09	52.02	17.98	48.75	33.71	49.69	46.08	55.12
13	43.45	08.20	50.94	58.77	63.51	51.87	18.46	48.68	34.24	49.79	46.45	55.39
14	43.64	07.86	51.31	58.54	63.93	51.70	18.96	48.59	34.77	49.91	46.79	55.68
15	43.86	07.54	51.65	58.32	64.36	51.52	19.50	48.51	35.29	50.05	47.09	55.98
16	44.07	07.24	51.96	58.09	64.80	51.32	20.07	48.45	35.80	50.21	47.36	56.28
17	44.27	06.95	52.26	57.83	65.27	51.11	20.65	48.41	36.27	50.38	47.60	56.57
18	44.45	06.67	52.56	57.55	65.77	50.91	21.23	48.39	36.72	50.56	47.83	56.84
19	44.60	06.39	52.88	57.26	66.30	50.74	21.80	48.40	37.14	50.73	48.05	57.10
20	44.73	06.10	53.22	56.96	66.85	50.59	22.35	48.43	37.54	50.89	48.26	57.36
21	44.86	05.78	53.60	56.66	67.41	50.46	22.88	48.47	37.93	51.05	48.47	57.61
22	44.99	05.44	54.01	56.37	67.95	50.35	23.38	48.52	38.31	51.21	48.70	57.85
23	45.14	05.09	54.44	56.10	68.46	50.25	23.86	48.56	38.69	51.36	48.95	58.09
24	45.33	04.73	54.88	55.86	68.95	50.16	24.32	48.60	39.08	51.50	49.21	58.33
25	45.56	04.37	55.32	55.64	69.42	50.08	24.78	48.63	39.49	51.64	49.48	58.59
26	45.82	04.02	55.75	55.42	69.88	49.99	25.24	48.64	39.92	51.78	49.76	58.88
27	46.10	03.69	56.17	55.22	70.33	49.89	25.71	48.64	40.36	51.93	50.03	59.18
28	46.38	03.38	56.57	55.03	70.77	49.77	26.19	48.64	40.82	52.09	50.28	59.50
29	46.66	03.10	56.94	54.84	71.22	49.64	26.69	48.65	41.29	52.28	50.50	59.83
30	46.93	02.84	57.30	54.64	71.69	49.52	27.22	48.66	41.75	52.50	50.68	60.16
31	47.19	02.58	57.66	54.42	72.18	49.40	27.77	48.68	42.18	52.74	50.83	60.49
32	47.43	02.31	58.02	54.20			28.34	48.73			50.94	60.80

AT UPPER TRANSIT AT GREENWICH

4 B Ursæ Minoris Mag. 7.01

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m	+	^h ^m	+	^h ^m	+	^h ^m	+	^h ^m	+	^h ^m	+
	8 34	88 49	8 34	88 49	8 34	88 49	8 33	88 49	8 33	88 49	8 32	88 49
1	17.96	17.41	31.22	26.52	25.04	34.95	62.31	41.49	32.35	42.70	64.58	38.34
2	18.63	17.62	31.44	26.85	24.67	35.25	61.28	41.65	31.24	42.62	63.95	38.10
3	19.36	17.84	31.60	27.19	24.22	35.56	60.20	41.77	30.19	42.52	63.36	37.88
4	20.14	18.07	31.68	27.55	23.68	35.86	59.12	41.86	29.21	42.40	62.78	37.67
5	20.96	18.31	31.66	27.91	23.05	36.15	58.08	41.93	28.29	42.29	62.18	37.46
6	21.78	18.58	31.54	28.26	22.34	36.42	57.08	42.00	27.42	42.19	61.55	37.26
7	22.56	18.87	31.34	28.59	21.59	36.66	56.14	42.06	26.58	42.11	60.89	37.07
8	23.25	19.17	31.11	28.89	20.85	36.88	55.25	42.11	25.74	42.04	60.20	36.87
9	23.84	19.47	30.90	29.16	20.14	37.09	54.39	42.17	24.87	41.98	59.48	36.65
10	24.33	19.77	30.74	29.42	19.48	37.29	53.54	42.24	23.95	41.92	58.74	36.42
11	24.74	20.07	30.61	29.68	18.87	37.48	52.67	42.33	23.00	41.85	57.99	36.17
12	25.10	20.36	30.52	29.96	18.28	37.68	51.76	42.43	22.01	41.77	57.25	35.90
13	25.45	20.62	30.45	30.25	17.70	37.90	50.79	42.54	20.98	41.68	56.55	35.61
14	25.83	20.87	30.37	30.57	17.11	38.14	49.77	42.64	19.94	41.58	55.92	35.30
15	26.26	21.12	30.26	30.88	16.48	38.39	48.71	42.72	18.86	41.46	55.38	34.99
16	26.73	21.37	30.11	31.20	15.80	38.64	47.60	42.78	17.83	41.31	54.92	34.68
17	27.23	21.63	29.89	31.54	15.05	38.89	46.46	42.83	16.85	41.14	54.53	34.38
18	27.74	21.91	29.60	31.89	14.24	39.13	45.32	42.86	15.92	40.96	54.18	34.09
19	28.23	22.21	29.24	32.23	13.38	39.36	44.20	42.87	15.07	40.77	53.84	33.82
20	28.69	22.53	28.81	32.55	12.47	39.57	43.12	42.87	14.29	40.58	53.48	33.56
21	29.10	22.87	28.34	32.86	11.52	39.77	42.10	42.85	13.57	40.40	53.07	33.31
22	29.44	23.22	27.84	33.16	10.57	39.95	41.15	42.81	12.88	40.24	52.59	33.05
23	29.70	23.57	27.33	33.43	09.64	40.10	40.26	42.77	12.18	40.09	52.05	32.78
24	29.89	23.91	26.84	33.68	08.75	40.23	39.41	42.75	11.43	39.95	51.48	32.50
25	30.02	24.24	26.39	33.92	07.91	40.36	38.56	42.75	10.61	39.82	50.93	32.19
26	30.12	24.55	26.01	34.16	07.13	40.49	37.68	42.76	09.73	39.68	50.43	31.86
27	30.19	24.85	25.67	34.41	06.40	40.63	36.74	42.78	08.81	39.51	50.00	31.52
28	30.26	25.13	25.36	34.67	05.68	40.79	35.72	42.79	07.87	39.31	49.66	31.17
29	30.36	25.40	25.04	34.95	04.94	40.96	34.63	42.78	06.94	39.08	49.39	30.82
30	^{30.51} ^{30.72}	^{25.65} ^{25.92}			04.14	41.13	33.49	42.75	06.07	38.84	49.18	30.48
31	30.97	26.21			03.27	41.31	32.35	42.70	05.28	38.59	49.01	30.15
32	31.22	26.52			02.31	41.49			04.58	38.34		

Mean R.A. 8^h 32^m 55^s.86 Mean Dec. +88° 49' 27".65 Sec δ 48.74 Tan δ +48.73

AT UPPER TRANSIT AT GREENWICH

4 B Ursæ Minoris Mag. 7.01

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 8 ^m 32 ^s 88 ^s 49	+	^h 8 ^m 32 ^s 88 ^s 49	+	^h 8 ^m 33 ^s 88 ^s 49	+	^h 8 ^m 33 ^s 88 ^s 48	+	^h 8 ^m 34 ^s 88 ^s 48	+	^h 8 ^m 34 ^s 88 ^s 48	+
1	49.01	30.15	48.18	19.69	02.56	09.30	28.88	61.13	04.40	56.37	40.00	56.68
2	48.84	29.84	48.37	19.37	03.14	08.97	29.88	60.89	05.75	56.30	41.17	56.82
3	48.65	29.55	48.53	19.05	03.75	08.63	30.96	60.64	07.09	56.26	42.27	56.96
4	48.43	29.28	48.67	18.72	04.41	08.29	32.12	60.40	08.40	56.24	43.29	57.10
5	48.17	29.00	48.82	18.38	05.15	07.95	33.32	60.18	09.66	56.23	44.24	57.23
6	47.89	28.71	49.00	18.02	05.97	07.62	34.55	59.98	10.84	56.22	45.15	57.34
7	47.58	28.40	49.22	17.65	06.86	07.31	35.78	59.81	11.95	56.20	46.07	57.43
8	47.25	28.08	49.50	17.27	07.80	07.01	36.97	59.66	13.01	56.16	47.03	57.52
9	46.94	27.74	49.87	16.88	08.76	06.72	38.10	59.51	14.07	56.11	48.06	57.61
10	46.67	27.38	50.32	16.50	09.70	06.45	39.16	59.35	15.16	56.05	49.14	57.71
11	46.45	27.01	50.84	16.13	10.60	06.20	40.16	59.19	16.31	55.99	50.27	57.83
12	46.31	26.63	51.41	15.77	11.45	05.95	41.13	59.01	17.53	55.93	51.42	57.97
13	46.26	26.25	51.99	15.43	12.23	05.70	42.13	58.82	18.81	55.88	52.54	58.12
14	46.29	25.88	52.54	15.12	12.96	05.44	43.18	58.62	20.13	55.85	53.62	58.30
15	46.38	25.53	53.02	14.82	13.69	05.16	44.30	58.42	21.46	55.84	54.64	58.50
16	46.49	25.19	53.44	14.52	14.46	04.86	45.49	58.22	22.77	55.87	55.58	58.71
17	46.60	24.87	53.82	14.21	15.30	04.55	46.74	58.03	24.04	55.92	56.46	58.92
18	46.67	24.57	54.17	13.88	16.22	04.23	48.03	57.86	25.24	55.98	57.29	59.12
19	46.67	24.27	54.54	13.52	17.20	03.92	49.33	57.73	26.39	56.05	58.08	59.31
20	46.62	23.96	54.96	13.14	18.25	03.63	50.60	57.62	27.49	56.12	58.85	59.50
21	46.53	23.62	55.46	12.76	19.32	03.37	51.82	57.53	28.55	56.17	59.62	59.68
22	46.43	23.26	56.05	12.38	20.39	03.13	53.00	57.44	29.58	56.21	60.40	59.85
23	46.36	22.89	56.70	12.01	21.44	02.91	54.13	57.35	30.61	56.25	61.22	60.02
24	46.36	22.51	57.39	11.66	22.45	02.70	55.22	57.27	31.65	56.28	62.08	60.20
25	46.45	22.12	58.12	11.34	23.42	02.49	56.28	57.18	32.72	56.30	62.99	60.38
26	46.62	21.73	58.85	11.04	24.35	02.29	57.34	57.08	33.84	56.32	63.93	60.57
27	46.86	21.35	59.55	10.76	25.25	02.08	58.40	56.97	35.02	56.35	64.88	60.78
28	47.14	20.99	60.21	10.48	26.13	01.86	59.49	56.85	36.25	56.40	65.81	61.02
29	47.43	20.64	60.83	10.20	27.02	01.63	60.63	56.72	37.51	56.47	66.68	61.28
30	47.71	20.31	61.42	09.91	27.93	01.38	61.82	56.59	38.77	56.56	67.47	61.56
31	47.96	20.00	61.99	09.61	28.88	01.13	63.08	56.47	40.00	56.68	68.16	61.84
32	48.18	19.69	62.56	09.30			64.40	56.37			68.77	62.11

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

6 B Ursæ Minoris Mag. 6.28

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s	⁺	^h ^m ^s	⁺	^h ^m ^s	⁺	^h ^m ^s	⁺	^h ^m ^s	⁺	^h ^m ^s	⁺
	12 14 88 03		12 15 88 03		12 15 88 03		12 15 88 03		12 14 88 03		12 14 88 03	
1	49.40	10.36	08.37	12.11	20.23	18.38	23.42	28.13	75.15	36.47	58.59	41.13
2	49.97	10.30	08.97	12.23	20.59	18.62	23.30	28.48	74.63	36.71	57.98	41.15
3	50.57	10.24	09.60	12.37	20.96	18.89	23.12	28.82	74.10	36.92	57.41	41.17
4	51.21	10.17	10.23	12.53	21.31	19.18	22.90	29.14	73.59	37.10	56.87	41.20
5	51.90	10.10	10.83	12.72	21.61	19.49	22.66	29.44	73.11	37.27	56.34	41.25
6	52.63	10.04	11.39	12.93	21.85	19.81	22.42	29.73	72.67	37.44	55.80	41.31
7	53.38	10.01	11.89	13.16	22.04	20.14	22.19	30.01	72.25	37.61	55.25	41.37
8	54.12	10.02	12.34	13.39	22.18	20.46	21.99	30.27	71.85	37.79	54.67	41.43
9	54.84	10.06	12.74	13.61	22.28	20.77	21.82	30.53	71.45	37.98	54.07	41.49
10	55.51	10.11	13.12	13.82	22.36	21.07	21.67	30.79	71.04	38.18	53.43	41.55
11	56.13	10.17	13.51	14.01	22.45	21.36	21.53	31.07	70.60	38.39	52.76	41.60
12	56.70	10.23	13.91	14.19	22.57	21.64	21.38	31.37	70.13	38.60	52.07	41.64
13	57.25	10.28	14.33	14.38	22.72	21.91	21.21	31.68	69.62	38.81	51.37	41.65
14	57.79	10.33	14.78	14.57	22.89	22.18	21.01	31.99	69.08	39.02	50.67	41.63
15	58.34	10.37	15.27	14.77	23.07	22.46	20.78	32.30	68.51	39.22	49.98	41.60
16	58.93	10.40	15.77	14.98	23.25	22.76	20.50	32.62	67.91	39.39	49.32	41.56
17	59.55	10.42	16.26	15.20	23.42	23.08	20.18	32.94	67.29	39.54	48.71	41.50
18	60.20	10.45	16.73	15.45	23.57	23.41	19.82	33.25	66.68	39.68	48.14	41.43
19	60.87	10.51	17.18	15.72	23.69	23.75	19.44	33.53	66.09	39.80	47.60	41.37
20	61.56	10.59	17.60	16.00	23.76	24.10	19.05	33.79	65.54	39.90	47.07	41.32
21	62.25	10.69	17.97	16.29	23.79	24.46	18.66	34.03	65.02	39.99	46.53	41.29
22	62.92	10.80	18.30	16.59	23.77	24.81	18.29	34.25	64.53	40.08	45.96	41.27
23	63.57	10.92	18.59	16.88	23.72	25.14	17.95	34.47	64.06	40.18	45.34	41.26
24	64.18	11.06	18.85	17.16	23.65	25.46	17.65	34.69	63.58	40.29	44.66	41.25
25	64.76	11.22	19.10	17.43	23.57	25.76	17.37	34.91	63.08	40.42	43.95	41.22
26	65.30	11.38	19.35	17.68	23.50	26.05	17.10	35.15	62.54	40.56	43.23	41.16
27	65.81	11.53	19.61	17.92	{23.43}	{26.32}	16.81	35.41	61.94	40.70	42.52	41.07
					{23.43}	{26.59}						
28	66.30	11.66	19.90	18.15	23.44	26.86	16.47	35.67	61.29	40.83	41.84	40.96
29	66.78	11.78	20.23	18.38	23.47	27.15	16.08	35.94	60.61	40.94	41.20	40.84
30	67.28	11.89			23.49	27.46	15.64	36.21	59.92	41.03	40.60	40.71
31	67.81	12.00			23.48	27.79	15.15	36.47	59.24	41.09	40.03	40.58
32	68.37	12.11			23.42	28.13			58.59	41.13		

Mean R.A. 12^h 14^m 36^s.85 Mean Dec. +88° 03' 36".77 Sec δ 29.54 Tan δ +29.52

AT UPPER TRANSIT AT GREENWICH

6 B Ursæ Minoris Mag. 6.28

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₂ ^m ₁₄ ^s ₈₈ ^o ₀₃	+	^h ₁₂ ^m ₁₄ ^s ₈₈ ^o ₀₃	+	^h ₁₂ ^m ₁₄ ^s ₈₈ ^o ₀₃	+	^h ₁₂ ^m ₁₄ ^s ₈₈ ^o ₀₃	+	^h ₁₂ ^m ₁₄ ^s ₈₈ ^o ₀₂	+	^h ₁₂ ^m ₁₄ ^s ₈₈ ^o ₀₂	+
1	40.03	40.58	22.89	35.02	11.12	25.56	07.21	14.26	12.16	62.56	25.38	53.72
2	39.49	40.46	22.44	34.79	10.80	25.23	07.16	13.86	12.53	62.18	26.01	53.50
3	38.96	40.36	21.97	34.56	10.48	24.88	07.14	13.45	12.94	61.81	26.62	53.30
4	38.42	40.26	21.48	34.34	10.17	24.51	07.17	13.02	13.37	61.47	27.21	53.12
5	37.86	40.16	20.97	34.11	09.88	24.13	07.25	12.59	13.79	61.15	27.76	52.96
6	37.28	40.07	20.44	33.86	09.63	23.74	07.38	12.17	14.19	60.84	28.26	52.80
7	36.68	39.98	19.90	33.58	09.43	23.34	07.54	11.77	14.55	60.54	28.74	52.62
8	36.05	39.88	19.38	33.29	09.28	22.93	07.71	11.39	14.87	60.25	29.23	52.41
9	35.39	39.77	18.89	32.99	09.16	22.53	07.87	11.02	15.17	59.96	29.74	52.19
10	34.72	39.64	18.44	32.67	09.07	22.14	08.00	10.66	15.46	59.65	30.29	51.98
11	34.05	39.48	18.04	32.34	08.98	21.78	08.09	10.31	15.76	59.32	30.89	51.77
12	33.40	39.30	17.68	32.01	08.87	21.43	08.15	09.96	16.10	58.98	31.53	51.57
13	32.78	39.11	17.36	31.69	08.72	21.08	08.18	09.60	16.49	58.63	32.20	51.38
14	32.20	38.90	17.06	31.38	08.53	20.74	08.21	09.22	16.93	58.28	32.89	51.21
15	31.67	38.68	16.74	31.08	08.32	20.39	08.27	08.81	17.41	57.94	33.58	51.07
16	31.17	38.47	16.38	30.79	08.10	20.01	08.38	08.39	17.92	57.62	34.25	50.95
17	30.70	38.28	15.99	30.52	07.89	19.61	08.55	07.97	18.44	57.33	34.90	50.84
18	30.23	38.10	15.56	30.24	07.71	19.20	08.77	07.55	18.96	57.06	35.52	50.74
19	29.74	37.93	15.11	29.94	07.57	18.79	09.02	07.14	19.47	56.80	36.12	50.65
20	29.21	37.77	14.66	29.62	07.48	18.37	09.29	06.76	19.95	56.55	36.69	50.56
21	28.63	37.61	14.22	29.28	07.45	17.95	09.56	06.40	20.41	56.31	37.25	50.47
22	28.01	37.44	13.82	28.93	07.45	17.54	09.83	06.05	20.85	56.07	37.81	50.37
23	27.38	37.24	13.47	28.56	07.47	17.16	10.09	05.71	21.28	55.83	38.38	50.26
24	26.75	37.02	13.17	28.19	07.49	16.79	10.34	05.38	21.70	55.58	38.97	50.14
25	26.14	36.78	12.91	27.83	07.50	16.43	10.56	05.06	22.13	55.32	39.60	50.01
26	25.58	36.52	12.68	27.48	07.49	16.08	10.76	04.74	22.58	55.05	40.26	49.89
27	25.07	36.25	12.45	27.14	07.46	15.73	10.95	04.41	23.06	54.78	40.96	49.78
28	24.60	35.98	12.22	26.82	07.41	15.38	11.14	04.07	23.58	54.51	41.69	49.69
29	24.16	35.72	11.97	26.51	07.34	15.02	11.34	03.71	24.15	54.23	42.43	49.63
30	23.74	35.48	11.71	26.20	07.27	14.65	11.57	03.33	24.75	53.96	43.15	49.60
31	23.32	35.25	11.43	25.88	07.21	14.26	11.84	02.94	25.38	53.72	43.84	49.59
32	22.89	35.02	11.12	25.56			12.16	02.56			44.49	49.58

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

57 B Ursæ Minoris Mag. 7.16

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s	+	^h ^m ^s	+	^h ^m ^s	+	^h ^m ^s	+	^h ^m ^s	+	^h ^m ^s	+
	14 57 87 28		14 57 87 28		14 58 87 28		14 58 87 28		14 58 87 28		14 58 87 28	
1	43.06	32.43	56.19	27.51	09.47	28.37	20.75	34.51	24.50	43.59	19.42	53.11
2	43.35	32.19	56.66	27.40	09.93	28.44	21.04	34.78	24.46	43.94	19.10	53.35
3	43.66	31.94	57.17	27.29	10.42	28.53	21.31	35.07	24.38	44.29	18.79	53.56
4	43.98	31.67	57.71	27.20	10.91	28.65	21.54	35.39	24.28	44.63	18.50	53.77
5	44.33	31.40	58.26	27.15	11.40	28.79	21.72	35.73	24.17	44.95	18.23	53.98
6	44.72	31.13	58.80	27.14	11.86	28.96	21.88	36.05	24.07	45.25	17.97	54.20
7	45.15	30.86	59.31	27.14	12.29	29.16	22.02	36.35	{23.98}	{45.53}	17.70	54.43
8	45.60	30.62	59.80	27.16	12.69	29.36	22.16	36.63	{23.91}	{45.80}	17.43	54.68
9	46.06	30.41	60.26	27.20	13.06	29.55	22.31	36.89	23.80	46.07	17.14	54.95
10	46.51	30.23	60.69	27.23	13.40	29.74	22.48	37.15	23.76	46.65	16.82	55.21
11	46.94	30.07	61.11	27.25	13.74	29.92	22.66	37.41	23.72	46.96	16.48	55.48
12	47.34	29.93	61.54	27.26	14.08	30.10	22.85	37.68	23.65	47.28	16.11	55.75
13	47.73	29.79	61.99	27.25	14.44	30.26	23.06	37.96	23.56	47.62	15.71	56.00
14	48.10	29.65	62.45	27.25	14.82	30.41	23.26	38.25	23.45	47.96	15.29	56.22
15	48.46	29.49	62.93	27.25	15.22	30.57	23.45	38.55	23.30	48.30	14.86	56.42
16	48.84	29.32	63.43	27.26	15.63	30.74	23.63	38.87	23.12	48.64	14.43	56.60
17	49.24	29.14	63.96	27.28	16.04	30.93	23.78	39.21	22.92	48.96	14.01	56.76
18	49.67	28.95	64.50	27.31	16.46	31.14	23.89	39.56	22.69	49.27	13.62	56.91
19	50.13	28.76	65.03	27.36	16.86	31.36	23.98	39.92	22.46	49.55	13.25	57.05
20	50.61	28.59	65.55	27.44	17.24	31.60	24.04	40.26	22.23	49.81	12.91	57.20
21	51.11	28.43	66.06	27.54	17.60	31.86	24.07	40.59	22.02	50.05	12.56	57.37
22	51.62	28.29	66.54	27.66	17.94	32.12	24.09	40.90	21.83	50.29	12.20	57.56
23	52.13	28.18	67.00	27.78	18.24	32.39	24.10	41.19	21.67	50.53	11.82	57.75
24	52.64	28.10	67.43	27.90	18.51	32.66	24.12	41.47	21.51	50.79	11.41	57.96
25	53.13	28.02	67.84	28.02	18.76	32.92	24.16	41.74	21.35	51.08	10.95	58.18
26	53.61	27.95	68.23	28.13	19.01	33.16	24.22	42.01	21.17	51.38	10.47	58.37
27	54.06	27.89	68.63	28.22	19.26	33.38	24.30	42.29	20.96	51.68	09.97	58.54
28	54.49	27.83	69.04	28.30	19.52	33.59	24.38	42.60	20.70	51.98	09.46	58.69
29	54.90	27.77	69.47	28.37	19.80	33.80	24.45	42.92	20.40	52.28	08.97	58.81
30	55.31	27.70			20.11	34.03	24.49	43.25	20.08	52.58	08.50	58.93
31	55.74	27.61			20.43	34.26	24.50	43.59	19.75	52.86	08.05	59.04
32	56.19	27.51			20.75	34.51			19.42	53.11		

Mean R.A. 14^h 58^m 01^s.45

Mean Dec. +87° 28' 56".35

Sec δ 22.76

Tan δ +22.74

AT UPPER TRANSIT AT GREENWICH

57 B Ursæ Minoris Mag. 7.16

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s 14 57 87 28	+	^h ^m ^s 14 57 87 28	+	^h ^m ^s 14 57 87 28	+	^h ^m ^s 14 57 87 28	+	^h ^m ^s 14 57 87 28	+	^h ^m ^s 14 57 87 28	+
1	68.05	59.04	52.52	60.65	36.27	57.54	22.84	50.33	14.32	39.86	13.60	28.81
2	67.62	59.13	52.04	60.64	35.76	57.40	22.42	50.04	14.17	39.44	13.77	28.43
3	67.20	59.22	51.54	60.63	35.23	57.24	22.01	49.73	14.06	39.04	13.94	28.07
4	66.79	59.33	51.02	60.63	34.69	57.06	21.61	49.40	13.98	38.64	14.11	27.73
5	66.37	59.45	50.49	60.63	34.14	56.87	21.24	49.06	13.91	38.26	14.26	27.43
6	65.94	59.59	49.93	60.62	33.60	56.65	20.91	48.70	13.85	37.91	14.39	27.14
7	65.49	59.73	49.35	60.60	33.08	56.41	20.61	48.35	13.78	37.56	14.50	26.84
8	65.02	59.87	48.76	60.56	32.59	56.16	20.33	48.00	13.68	37.23	14.60	26.53
9	64.52	60.00	48.16	60.49	32.14	55.90	20.06	47.67	13.56	36.91	14.71	26.21
10	64.00	60.13	47.58	60.40	31.71	55.65	19.79	47.37	13.42	36.57	14.83	25.86
11	63.46	60.24	47.02	60.28	31.29	55.41	19.49	47.09	13.28	36.21	14.98	25.49
12	62.91	60.33	46.48	60.15	30.88	55.19	19.17	46.81	13.15	35.84	15.17	25.12
13	62.36	60.40	45.98	60.02	30.46	54.98	18.83	46.51	13.04	35.45	15.40	24.76
14	61.81	60.43	45.50	59.90	30.01	54.78	18.48	46.19	12.97	35.04	15.65	24.42
15	61.29	60.44	45.02	59.79	29.53	54.58	18.13	45.86	12.93	34.63	15.92	24.08
16	60.80	60.45	44.54	59.70	29.03	54.36	17.79	45.51	12.93	34.22	16.21	23.76
17	60.33	60.47	44.04	59.62	28.52	54.13	17.48	45.15	12.96	33.82	16.50	23.46
18	59.87	60.50	43.50	59.54	28.01	53.88	17.20	44.77	13.01	33.44	16.78	23.19
19	59.41	60.54	42.93	59.46	27.52	53.61	16.96	44.39	13.06	33.08	17.05	22.93
20	58.94	60.59	42.35	59.38	27.06	53.33	16.75	44.01	13.10	32.73	17.30	22.67
21	58.44	60.66	41.76	59.28	26.64	53.03	16.56	43.64	13.14	32.40	17.54	22.41
22	57.91	60.74	41.18	59.14	26.24	52.73	16.38	43.29	13.17	32.08	17.78	22.14
23	57.34	60.81	40.62	58.99	25.87	52.43	16.20	42.96	13.19	31.76	18.02	21.87
24	56.75	60.86	40.08	58.82	25.51	52.15	16.02	42.64	13.20	31.42	18.26	21.58
25	56.16	60.87	39.57	58.64	25.16	51.88	15.83	42.32	13.20	31.08	18.51	21.28
26	55.57	60.86	39.09	58.46	24.80	51.62	15.62	41.99	13.21	30.74	18.80	20.98
27	55.01	60.83	38.63	58.28	24.44	51.36	15.40	41.67	13.22	30.38	19.12	20.67
28	54.48	60.79	38.17	58.11	24.06	51.10	15.17	41.35	13.26	29.99	19.47	20.36
29	53.98	60.75	37.71	57.96	23.67	50.85	14.94	41.01	13.34	29.59	19.85	20.07
30	53.48	60.71	37.25	57.82	23.26	50.60	14.72	40.64	13.45	29.19	20.24	19.80
31	53.00	60.68	36.77	57.68	22.84	50.33	14.51	40.26	13.60	28.81	20.63	19.56
32	52.52	60.65	36.27	57.54			14.32	39.86			21.01	19.35

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

ε Ursæ Minoris Mag. 4.40

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	$16^h 52^m 82^s.08$	+	$16^h 52^m 82^s.08$	+	$16^h 52^m 82^s.08$	+	$16^h 52^m 82^s.08$	+	$16^h 52^m 82^s.08$	+	$16^h 52^m 82^s.08$	+
1	23.30	34.61	26.18	25.93	30.33	22.38	35.11	24.24	38.41	31.22	39.41	41.19
2	23.34	34.30	26.30	25.68	30.49	22.30	35.26	24.40	38.48	31.56	39.39	41.53
3	23.38	33.97	26.43	25.43	30.65	22.22	35.40	24.59	38.55	31.90	39.36	41.85
4	23.43	33.63	26.57	25.19	30.82	22.16	35.54	24.80	38.61	32.24	39.33	42.15
5	23.48	33.28	26.72	24.97	30.99	22.13	35.67	25.02	38.66	32.56	39.31	42.44
6	23.54	32.91	26.88	24.78	31.16	22.13	35.79	25.23	38.71	32.86	39.28	42.72
7	23.61	32.54	27.03	24.62	31.33	22.16	35.91	25.44	38.76	33.14	39.26	43.31
8	23.69	32.19	27.17	24.49	31.49	22.21	36.02	25.65	38.81	33.41	39.25	43.63
9	23.78	31.86	27.31	24.37	31.64	22.27	36.13	25.85	38.87	33.68	39.23	43.96
10	23.87	31.55	27.45	24.24	31.79	22.33	36.25	26.04	38.93	33.95	39.20	44.31
11	23.96	31.26	27.59	24.11	31.94	22.38	36.37	26.22	38.99	34.23	39.17	44.66
12	24.05	30.99	27.72	23.98	32.09	22.42	36.49	26.40	39.05	34.53	39.13	45.02
13	24.13	30.73	27.85	23.84	32.24	22.45	36.62	26.58	39.11	34.84	39.08	45.39
14	24.21	30.48	27.99	23.68	32.39	22.47	36.75	26.77	39.16	35.18	39.02	45.75
15	24.29	30.22	28.14	23.51	32.55	22.48	36.88	26.98	39.21	35.53	38.96	46.08
16	24.37	29.94	28.29	23.34	32.71	22.50	37.00	27.22	39.25	35.88	38.89	46.38
17	24.46	29.64	28.45	23.18	32.87	22.54	37.12	27.48	39.28	36.23	38.82	46.66
18	24.55	29.34	28.61	23.05	33.04	22.59	37.23	27.76	39.30	36.59	38.76	46.93
19	24.65	29.03	28.78	22.94	33.21	22.65	37.34	28.05	39.32	36.94	38.70	47.19
20	24.76	28.73	28.95	22.84	33.37	22.74	37.44	28.34	39.33	37.28	38.64	47.45
21	24.87	28.43	29.12	22.76	33.53	22.85	37.53	28.62	39.34	37.60	38.59	47.72
22	24.99	28.14	29.28	22.70	33.69	22.99	37.62	28.89	39.35	37.90	38.54	48.00
23	25.11	27.87	29.44	22.65	33.84	23.14	37.70	29.15	39.36	38.18	38.48	48.31
24	25.24	27.62	29.60	22.62	33.98	23.29	37.78	29.40	39.38	38.45	38.41	48.64
25	25.37	27.38	29.75	22.59	34.12	23.43	37.86	29.63	39.40	38.73	38.33	48.98
26	25.49	27.16	29.89	22.55	34.26	23.57	37.95	29.86	39.42	39.04	38.25	49.32
27	25.61	26.96	30.04	22.51	34.39	23.69	38.04	30.09	39.44	39.37	38.16	49.64
28	25.72	26.78	30.18	22.45	34.52	23.80	38.14	30.34	39.45	39.72	38.06	49.94
29	25.83	26.59	30.33	22.38	34.66	23.90	38.24	30.60	39.46	40.09	37.96	50.22
30	25.95	26.39			34.80	24.00	38.33	30.89	39.45	40.47	37.86	50.48
31	26.07	26.17			34.95	24.11	38.41	31.22	39.43	40.84	37.77	50.73
32	26.18	25.93			35.11	24.24			39.41	41.19		

Mean R.A. $16^h 52^m 33^s.42$ Mean Dec. $+82^\circ 08' 49''.60$ Sec δ 7.32 Tan δ $+7.25$

APPARENT PLACES OF STARS, 1935

319

AT UPPER TRANSIT AT GREENWICH

ε Ursæ Minoris Mag. 4.40

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h _m ^s	[°] _' [″]	^h _m ^s	[°] _' [″]	^h _m ^s	[°] _' [″]	^h _m ^s	[°] _' [″]	^h _m ^s	[°] _' [″]	^h _m ^s	[°] _' [″]
	16 52	82 08	16 52	82 08	16 52	82 08	16 52	82 08	16 52	82 08	16 52	82 08
1	37.77	50.73	33.97	57.45	28.80	60.13	23.45	58.21	18.77	51.65	16.23	42.02
2	37.68	50.96	33.83	57.61	28.62	60.17	23.27	58.08	18.65	51.34	16.20	41.63
3	37.59	51.19	33.69	57.78	28.43	60.21	23.09	57.93	18.53	51.02	16.17	41.26
4	37.51	51.43	33.54	57.95	28.24	60.25	22.91	57.76	18.42	50.69	16.15	40.92
5	37.42	51.68	33.39	58.12	28.05	60.27	22.73	57.58	18.32	50.37	16.13	40.61
6	37.33	51.95	33.23	58.30	27.86	60.26	22.56	57.38	18.22	50.07	16.10	40.30
7	37.24	52.23	33.07	58.47	27.67	60.22	22.40	57.17	18.12	49.79	16.07	39.99
8	37.14	52.52	32.90	58.63	27.48	60.15	22.25	56.95	18.02	49.53	16.04	39.67
9	37.03	52.82	32.73	58.77	27.30	60.07	22.10	56.74	17.91	49.27	16.00	39.34
10	36.92	53.11	32.55	58.89	27.12	59.99	21.95	56.56	17.80	49.01	15.97	38.98
11	36.80	53.38	32.38	58.98	26.95	59.91	21.80	56.40	17.69	48.74	15.95	38.60
12	36.68	53.64	32.21	59.05	26.78	59.84	21.64	56.26	17.58	48.45	15.93	38.23
13	36.55	53.88	32.04	59.10	26.61	59.79	21.48	56.11	17.47	48.14	15.92	37.83
14	36.42	54.09	31.88	59.15	26.44	59.77	21.32	55.95	17.36	47.80	15.92	37.43
15	36.29	54.28	31.73	59.22	26.26	59.77	21.15	55.77	17.27	47.45	15.93	37.04
16	36.16	54.46	31.57	59.30	26.07	59.76	20.98	55.56	17.19	47.09	15.94	36.67
17	36.04	54.64	31.41	59.40	25.88	59.73	20.82	55.32	17.11	46.72	15.96	36.31
18	35.92	54.82	31.24	59.52	25.69	59.67	20.66	55.07	17.04	46.36	15.98	35.97
19	35.81	55.02	31.07	59.64	25.50	59.58	20.51	54.81	16.97	46.02	16.00	35.65
20	35.69	55.24	30.89	59.75	25.31	59.47	20.37	54.55	16.91	45.70	16.02	35.34
21	35.56	55.47	30.71	59.85	25.13	59.34	20.23	54.30	16.85	45.39	16.03	35.02
22	35.43	55.71	30.52	59.92	24.95	59.20	20.10	54.05	16.79	45.09	16.05	34.70
23	35.29	55.96	30.33	59.97	24.78	59.06	19.97	53.81	16.72	44.79	16.06	34.38
24	35.14	56.20	30.15	60.00	24.61	58.93	19.84	53.58	16.65	44.49	16.08	34.04
25	34.99	56.42	29.97	60.01	24.45	58.81	19.72	53.36	16.58	44.19	16.10	33.69
26	34.83	56.61	29.80	60.01	24.29	58.70	19.59	53.15	16.51	43.87	16.12	33.32
27	34.68	56.77	29.63	60.00	24.13	58.59	19.46	52.93	16.44	43.53	16.15	32.94
28	34.53	56.91	29.46	60.00	23.97	58.49	19.32	52.70	16.38	43.17	16.19	32.55
29	34.38	57.05	29.30	60.02	23.80	58.40	19.18	52.46	16.32	42.80	16.24	32.17
30	34.24	57.18	29.14	60.05	23.63	58.31	19.04	52.21	16.27	42.41	16.29	31.80
31	34.10	57.31	28.97	60.09	23.45	58.21	18.90	51.94	16.23	42.02	16.35	31.46
32	33.97	57.45	28.80	60.13			18.77	51.65			16.42	31.14

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

δ Ursæ Minoris Mag. 4.44

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s _°	+	^h ^m ^s _°	+	^h ^m ^s _°	+	^h ^m ^s _°	+	^h ^m ^s _°	+	^h ^m ^s _°	+
	17 52 86 36		17 52 86 36		17 52 86 36		17 53 86 36		17 53 86 36		17 53 86 36	
1	42.19	37.41	45.75	27.93	53.78	22.56	04.73	21.97	13.85	27.00	18.52	36.08
2	42.18	37.11	45.94	27.64	54.09	22.40	05.11	22.04	14.10	27.29	18.53	36.43
3	42.16	36.79	46.15	27.34	54.42	22.25	05.48	22.14	14.33	27.58	18.54	36.75
4	42.14	36.45	46.39	27.04	54.77	22.10	05.84	22.27	14.53	27.87	18.55	37.05
5	42.13	36.09	46.65	26.75	55.15	21.98	06.19	22.42	14.72	28.15	18.57	37.33
6	42.14	35.72	46.92	26.49	55.54	21.90	06.53	22.58	14.90	28.41	18.59	37.61
7	42.18	35.34	47.20	26.26	55.92	21.84	06.85	22.74	15.08	28.66	18.62	37.90
8	42.25	34.97	47.49	26.06	56.29	21.81	07.15	22.89	15.26	28.90	18.66	38.20
9	42.34	34.61	47.77	25.88	56.65	21.80	07.44	23.02	15.44	29.14	18.70	38.52
10	42.45	34.28	48.03	25.70	56.99	21.79	07.73	23.13	15.64	29.37	18.74	38.85
11	42.57	33.97	48.29	25.52	57.32	21.78	08.03	23.24	15.85	29.61	18.77	39.19
12	42.68	33.68	48.54	25.34	57.65	21.75	08.34	23.35	16.06	29.86	18.79	39.54
13	42.78	33.41	48.79	25.15	57.97	21.70	08.66	23.46	16.27	30.13	18.80	39.90
14	42.88	33.13	49.04	24.94	58.30	21.64	09.00	23.58	16.48	30.41	18.78	40.27
15	42.97	32.84	49.30	24.72	58.64	21.58	09.35	23.72	16.68	30.71	18.73	40.64
16	43.05	32.55	49.58	24.49	59.00	21.52	09.70	23.88	16.87	31.03	18.65	41.00
17	43.13	32.25	49.89	24.26	59.37	21.47	10.04	24.05	17.03	31.37	18.56	41.34
18	43.23	31.92	50.21	24.04	59.76	21.43	10.37	24.25	17.17	31.71	18.47	41.65
19	43.35	31.58	50.55	23.83	60.15	21.41	10.68	24.47	17.29	32.04	18.38	41.94
20	43.49	31.24	50.90	23.65	60.55	21.41	10.98	24.70	17.39	32.36	18.30	42.22
21	43.65	30.91	51.25	23.49	60.94	21.44	11.25	24.93	17.48	32.66	{18.24}	{42.50}
											{18.18}	{42.79}
22	43.83	30.58	51.60	23.35	61.33	21.48	11.51	25.15	17.56	32.94	18.13	43.09
23	44.02	30.26	51.94	23.24	61.71	21.54	11.75	25.36	17.64	33.21	18.08	43.42
24	44.23	29.95	52.27	23.14	62.07	21.61	11.98	25.56	17.74	33.47	18.02	43.78
25	44.45	29.67	52.59	23.05	62.40	21.68	12.21	25.75	17.86	33.72	17.94	44.15
26	44.66	29.41	52.89	22.95	62.72	21.75	12.45	25.92	17.99	33.99	17.83	44.51
27	44.86	29.17	53.19	22.84	63.04	21.81	12.71	26.09	18.12	34.29	17.70	44.86
28	45.05	28.93	53.48	22.71	63.35	21.85	12.99	26.28	18.24	34.62	17.55	45.20
29	45.23	28.69	53.78	22.56	63.67	21.87	13.28	26.49	18.35	34.98	17.38	45.53
30	45.41	28.45			64.01	21.89	13.57	26.73	18.43	35.35	17.21	45.84
31	45.58	28.20			64.36	21.92	13.85	27.00	18.49	35.72	17.05	46.13
32	45.75	27.93			64.73	21.97			18.52	36.08		

Mean R.A. 17^h 53^m 10^s.28 Mean Dec. +86° 36' 45".96 Sec δ 16.93 Tan δ +16.90

AT UPPER TRANSIT AT GREENWICH

δ Ursæ Minoris Mag. 4.44

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s 17 53 86 36	+	^h ^m ^s 17 52 86 36	+	^h ^m ^s 17 52 86 36	+	^h ^m ^s 17 52 86 36	+	^h ^m ^s 17 52 86 36	+	^h ^m ^s 17 52 86 36	+
1	17.05	46.13	70.01	54.61	58.85	59.92	46.08	60.96	33.45	57.31	24.68	49.71
2	16.90	46.41	69.74	54.83	58.46	60.05	45.63	60.94	33.06	57.09	24.49	49.37
3	16.76	46.68	69.47	55.06	58.05	60.19	45.17	60.90	32.69	56.85	24.32	49.04
4	16.62	46.95	69.19	55.30	57.63	60.32	44.70	60.85	32.34	56.61	24.17	48.72
5	16.49	47.23	68.89	55.55	57.19	60.44	44.24	60.77	32.02	56.36	24.02	48.42
6	16.36	47.53	68.58	55.80	56.73	60.54	43.79	60.67	31.71	56.12	23.87	48.14
7	16.22	47.85	68.24	56.05	56.27	60.61	43.35	60.55	31.41	55.90	23.70	47.87
8	16.07	48.18	67.88	56.29	55.82	60.65	42.93	60.43	31.11	55.70	23.52	47.60
9	15.91	48.51	67.51	56.52	55.38	60.67	42.53	60.32	30.79	55.52	23.33	47.32
10	15.73	48.84	67.13	56.72	54.95	60.69	42.14	60.23	30.46	55.35	23.14	47.02
11	15.52	49.16	66.75	56.90	54.54	60.71	41.76	60.15	30.11	55.17	22.95	46.70
12	15.29	49.48	66.37	57.06	54.15	60.74	41.37	60.09	29.76	54.97	22.78	46.35
13	15.05	49.79	66.00	57.21	53.76	60.78	40.97	60.03	29.41	54.74	22.64	45.99
14	14.79	50.08	65.64	57.35	53.36	60.85	40.54	59.96	29.07	54.48	22.53	45.63
15	14.53	50.34	65.30	57.49	52.95	60.93	40.10	59.88	28.74	54.20	22.43	45.27
16	14.28	50.57	64.98	57.65	52.52	61.01	39.65	59.79	28.43	53.92	22.34	44.91
17	14.04	50.80	64.65	57.83	52.07	61.08	39.20	59.68	28.14	53.63	22.27	44.56
18	13.82	51.04	64.31	58.03	51.60	61.14	38.76	59.54	27.88	53.33	22.21	44.23
19	13.61	51.29	63.95	58.23	51.13	61.17	38.34	59.37	27.64	53.04	22.16	43.92
20	13.40	51.56	63.56	58.44	50.66	61.17	37.94	59.19	27.40	52.76	22.10	43.62
21	13.18	51.85	63.16	58.64	50.20	61.15	37.56	59.02	27.16	52.50	22.04	43.33
22	12.95	52.15	62.74	58.82	49.76	61.11	37.19	58.85	26.93	52.25	21.97	43.03
23	12.70	52.45	62.31	58.97	49.33	61.07	36.83	58.69	26.69	52.01	21.89	42.72
24	12.42	52.75	61.89	59.09	48.92	61.03	36.48	58.53	26.45	51.77	21.81	42.40
25	12.12	53.05	61.48	59.20	48.52	61.00	36.13	58.38	26.19	51.53	21.73	42.07
26	11.80	53.33	61.08	59.29	48.12	60.98	35.77	58.24	25.93	51.28	21.65	41.72
27	11.48	53.57	60.69	59.38	47.72	60.97	35.41	58.11	25.66	51.00	21.59	41.35
28	11.17	53.79	60.32	59.47	47.32	60.96	35.04	57.98	25.40	50.70	21.56	40.97
29	10.87	54.00	59.96	59.57	46.92	60.96	34.65	57.84	25.14	50.39	21.55	40.59
30	10.57	54.20	59.60	59.68	46.51	60.96	34.25	57.68	24.90	50.06	21.57	40.22
31	10.28	54.40	59.23	59.80	46.08	60.96	33.85	57.51	24.68	49.71	21.60	39.86
32	10.01	54.61	58.85	59.92			33.45	57.31			21.64	39.53

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

 λ Ursæ Minoris Mag. 6.55

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s	[°] ['] [″]	^h ^m ^s	[°] ['] [″]	^h ^m ^s	[°] ['] [″]	^h ^m ^s	[°] ['] [″]	^h ^m ^s	[°] ['] [″]	^h ^m ^s	[°] ['] [″]
	18 38 89 02	+	18 38 89 02	+	18 39 89 02	+	18 39 89 02	+	18 40 89 02	+	18 40 89 02	+
1	43.63	19.81	47.71	10.07	10.61	03.50	47.36	01.02	22.13	04.29	44.65	12.25
2	43.31	19.52	48.07	09.75	11.54	03.30	48.73	01.02	23.21	04.52	44.93	12.57
3	42.95	19.22	48.52	09.42	12.55	03.09	50.12	01.05	24.22	04.76	45.17	12.88
4	42.57	18.90	49.08	09.09	13.67	02.88	51.48	01.11	25.13	05.01	45.40	13.18
5	42.22	18.56	49.75	08.78	14.87	02.70	52.79	01.20	25.96	05.25	45.65	13.46
6	41.93	18.20	50.52	08.49	16.12	02.56	54.02	01.30	26.74	05.48	45.94	13.73
7	41.73	17.82	51.34	08.22	17.39	02.44	55.17	01.39	27.50	05.69	46.27	14.01
8	41.65	17.45	52.16	07.97	18.65	02.35	56.27	01.47	28.27	05.88	46.63	14.30
9	41.69	17.10	52.96	07.74	19.85	02.28	57.34	01.54	29.08	06.06	47.00	14.59
10	41.82	16.77	53.71	07.53	20.98	02.21	58.42	01.60	29.92	06.25	47.38	14.89
11	41.98	16.45	54.41	07.32	22.05	02.14	59.52	01.66	30.79	06.46	47.75	15.21
12	42.13	16.15	55.08	07.10	23.10	02.05	60.66	01.71	31.71	06.67	48.08	15.55
13	42.25	15.87	55.73	06.86	24.14	01.95	61.86	01.76	32.65	06.89	48.35	15.91
14	42.33	15.59	56.40	06.61	25.21	01.83	63.11	01.82	33.59	07.13	48.53	16.28
15	42.36	15.30	57.12	06.35	26.33	01.71	64.39	01.90	34.51	07.39	48.62	16.65
16	42.37	15.00	57.90	06.08	27.51	01.59	65.69	02.00	35.38	07.67	48.62	17.01
17	42.39	14.68	58.76	05.81	28.75	01.48	67.00	02.12	36.18	07.96	48.54	17.35
18	42.44	14.34	59.69	05.55	30.04	01.38	68.29	02.26	36.91	08.26	48.42	17.66
19	42.55	13.99	60.68	05.30	31.38	01.29	69.54	02.42	37.55	08.55	48.30	17.95
20	42.74	13.64	61.73	05.06	32.76	01.22	70.73	02.59	38.10	08.84	48.21	18.24
21	43.01	13.29	62.82	04.84	34.14	01.18	71.84	02.76	38.59	09.12	48.17	18.53
22	43.35	12.94	63.92	04.65	35.50	01.16	72.86	02.93	39.05	09.38	48.20	18.82
23	43.77	12.61	65.01	04.49	36.83	01.15	73.81	03.10	39.53	09.62	48.28	19.12
24	44.25	12.29	66.06	04.35	38.10	01.16	74.71	03.25	40.06	09.85	48.37	19.45
25	44.76	11.98	67.06	04.20	39.29	01.17	75.62	03.38	40.65	10.09	48.42	19.80
26	45.28	11.69	67.99	04.04	40.42	01.18	76.57	03.50	41.30	10.35	48.40	20.17
27	45.79	11.42	68.87	03.87	41.50	01.18	77.59	03.62	41.99	10.62	48.28	20.55
28	46.26	11.16	69.73	03.69	42.57	01.16	78.68	03.75	42.67	10.92	48.07	20.92
29	46.67	10.90	70.61	03.50	43.66	01.13	79.83	03.90	43.30	11.24	47.78	21.28
30	47.04	10.64			44.81	01.09	80.99	04.08	43.85	11.57	47.42	21.62
31	47.38	10.37			46.05	01.05	82.13	04.29	44.30	11.91	47.04	21.94
32	47.71	10.07			47.36	01.02			44.65	12.25		

Mean R.A. 18^h 40^m 29^s.64 Mean Dec. +89° 02' 22".93 Sec δ 59.67 Tan δ +59.66

AT UPPER TRANSIT AT GREENWICH

 λ Ursæ Minoris Mag. 6.55

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s 18 40 89 02	^h ^m ^s 21 94	^h ^m ^s 18 39 89 02	^h ^m ^s 31 77	^h ^m ^s 18 39 89 02	^h ^m ^s 38 94	^h ^m ^s 18 38 89 02	^h ^m ^s 42 21	^h ^m ^s 18 37 89 02	^h ^m ^s 40 98	^h ^m ^s 18 37 89 02	^h ^m ^s 45 11
1	47.04	21.94	88.32	31.77	53.31	38.94	69.35	42.21	82.12	40.98	45.11	35.24
2	46.68	22.24	87.54	32.03	52.06	39.13	67.75	42.27	80.56	40.83	44.16	34.94
3	$\begin{Bmatrix} 46.34 \\ 46.04 \end{Bmatrix}$	$\begin{Bmatrix} 22.53 \\ 22.83 \end{Bmatrix}$	86.77	32.30	50.74	39.33	66.09	42.32	79.06	40.66	43.32	34.65
4	45.77	23.13	85.97	32.58	49.35	39.53	64.40	42.36	77.65	40.48	42.55	34.38
5	45.53	23.43	85.13	32.88	47.89	39.72	62.70	42.38	76.32	40.31	41.80	34.13
6	45.31	23.74	84.24	33.18	46.36	39.90	61.02	42.36	75.07	40.15	41.03	33.90
7	45.07	24.07	83.28	33.48	44.79	40.05	59.40	42.32	73.86	40.00	40.22	33.67
8	44.80	24.41	82.22	33.78	43.20	40.17	57.86	42.28	72.64	39.86	39.36	33.44
9	44.49	24.76	81.08	34.07	41.65	40.27	56.40	42.26	71.39	39.74	38.44	33.20
10	44.10	25.11	79.88	34.34	40.17	40.37	54.99	42.25	70.08	39.63	37.48	32.94
11	43.62	25.47	78.64	34.58	38.77	40.47	53.60	42.25	68.70	39.52	36.54	32.66
12	43.05	25.84	77.40	34.79	37.42	40.57	52.18	42.25	67.27	39.39	35.65	32.36
13	42.40	26.19	76.21	34.99	36.09	40.68	50.70	42.26	65.83	39.22	34.83	32.03
14	41.69	26.51	75.08	35.19	34.77	40.81	49.15	42.27	64.40	39.03	34.10	31.69
15	40.96	26.80	74.02	35.39	33.40	40.96	47.53	42.27	63.01	38.82	33.46	31.36
16	40.24	27.07	73.00	35.60	31.95	41.12	45.86	42.26	61.70	38.60	32.89	31.04
17	39.57	27.34	71.99	35.84	30.42	41.28	44.18	42.23	60.48	38.37	32.39	30.74
18	38.97	27.61	70.96	36.10	28.82	41.42	42.52	42.17	59.34	38.14	31.93	30.44
19	38.42	27.90	69.87	36.37	27.18	41.53	40.91	42.08	58.25	37.91	31.49	30.14
20	37.90	28.20	68.67	36.64	25.53	41.61	39.36	41.98	57.20	37.69	31.04	29.85
21	37.39	28.52	67.39	36.91	23.90	41.67	37.88	41.88	56.18	37.49	30.57	29.57
22	36.83	28.86	66.05	37.16	22.32	41.72	36.46	41.78	55.17	37.29	30.08	29.29
23	36.17	29.21	64.67	37.38	20.80	41.76	35.10	41.69	54.14	37.10	29.56	29.02
24	35.41	29.56	63.28	37.58	19.33	41.80	33.76	41.61	53.08	36.92	29.00	28.74
25	34.56	29.90	61.91	37.76	17.91	41.84	32.43	41.54	51.98	36.73	28.41	28.44
26	33.65	30.22	60.59	37.93	16.52	41.88	31.08	41.47	50.83	36.52	27.84	28.11
27	32.70	30.51	59.31	38.08	15.14	41.93	29.70	41.40	49.64	36.30	27.31	27.76
28	31.76	30.77	58.08	38.22	13.75	42.00	28.28	41.34	48.45	36.06	26.85	27.40
29	30.84	31.02	56.88	38.38	12.33	42.08	26.81	41.28	47.28	35.80	26.50	27.04
30	29.96	31.27	55.70	38.56	10.87	42.15	25.28	41.21	46.16	35.53	26.26	26.68
31	29.12	31.52	54.52	38.75	09.35	42.21	23.71	41.11	45.11	35.24	26.11	26.33
32	28.32	31.77	53.31	38.94			22.12	40.98			26.01	26.00

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Groombridge 3548 Mag. 7.36

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₂₁ ^m ₁₁ ^s ₈₆ ⁴⁶ ₄₆	+	^h ₂₁ ^m ₁₁ ^s ₈₆ ⁴⁶ ₄₆	+	^h ₂₁ ^m ₁₁ ^s ₈₆ ⁴⁶ ₄₆	+	^h ₂₁ ^m ₁₂ ^s ₈₆ ⁴⁶ ₄₆	+	^h ₂₁ ^m ₁₂ ^s ₈₆ ⁴⁶ ₄₆	+	^h ₂₁ ^m ₁₂ ^s ₈₆ ⁴⁶ ₄₆	+
1	64.73	28.79	58.90	20.38	59.69	11.59	06.70	03.98	17.40	01.25	28.69	04.26
2	64.46	28.61	58.77	20.07	59.77	11.29	07.03	03.77	17.83	01.27	29.01	04.48
3	64.17	28.43	58.65	19.75	59.86	10.98	07.38	03.57	18.25	01.31	29.30	04.69
4	63.87	28.23	58.55	19.41	59.98	10.66	07.74	03.40	18.65	01.37	29.57	04.89
5	63.56	28.00	58.48	19.05	60.14	10.33	08.11	03.27	19.03	01.44	29.84	05.09
6	63.24	27.75	58.44	18.70	60.33	10.01	08.48	03.16	19.39	01.51	30.11	05.27
7	62.93	27.49	58.44	18.36	60.55	09.71	08.84	03.06	19.73	01.57	30.39	05.44
8	62.65	27.21	58.46	18.03	60.78	09.44	09.17	02.96	20.07	01.61	30.68	05.61
9	62.40	26.92	58.49	17.72	61.00	09.19	09.48	02.87	20.40	01.64	30.99	05.79
10	62.19	26.63	58.52	17.43	61.22	08.95	09.79	02.77	20.74	01.67	31.31	05.98
11	62.00	26.35	58.54	17.15	61.43	08.73	10.09	02.64	21.09	01.69	31.63	06.19
12	61.83	26.08	58.55	16.88	61.62	08.50	10.40	02.49	21.46	01.71	31.96	06.41
13	61.66	25.84	58.54	16.60	61.80	08.26	10.73	02.34	21.85	01.74	32.28	06.66
14	61.48	25.61	58.53	16.29	61.98	08.01	11.07	02.20	22.25	01.79	32.59	06.93
15	61.29	25.37	58.52	15.97	62.16	07.75	11.43	02.06	22.65	01.86	32.89	07.21
16	61.09	25.13	58.51	15.63	62.36	07.48	11.80	01.93	23.05	01.95	33.16	07.50
17	60.88	24.87	58.52	15.28	62.58	07.20	12.19	01.82	23.46	02.06	33.40	07.79
18	60.66	24.59	58.55	14.92	62.81	06.92	12.59	01.74	23.86	02.20	33.61	08.07
19	60.45	24.30	58.60	14.56	63.06	06.64	13.00	01.67	24.24	02.35	33.81	08.33
20	60.25	23.99	58.68	14.21	63.33	06.37	13.41	01.62	24.59	02.50	34.01	08.58
21	60.06	23.67	58.78	13.87	63.62	06.12	13.81	01.59	24.92	02.64	34.22	08.82
22	59.89	23.35	58.90	13.55	63.94	05.89	14.18	01.58	25.23	02.77	34.44	09.05
23	59.75	23.02	59.03	13.25	64.25	05.68	14.53	01.57	25.53	02.89	34.68	09.29
24	59.63	22.69	59.17	12.96	64.56	05.49	14.87	01.55	25.83	03.00	34.94	09.54
25	59.53	22.37	59.30	12.69	64.85	05.31	15.19	01.52	26.14	03.11	35.21	09.81
26	59.45	22.06	59.42	12.43	65.13	05.15	15.51	01.47	26.48	03.21	35.48	10.11
27	59.38	21.77	59.52	12.16	65.39	04.99	15.84	01.41	26.84	03.32	35.74	10.43
28	59.31	21.49	59.61	11.88	65.64	04.81	16.19	01.34	27.21	03.46	35.97	10.77
29	59.23	21.23	59.69	11.59	65.88	04.61	16.57	01.28	27.59	03.62	36.17	11.11
30	59.13	20.96			66.13	04.40	16.98	01.25	27.97	03.81	36.34	11.45
31	59.02	20.68			66.40	04.19	17.40	01.25	28.34	04.03	36.50	11.78
32	58.90	20.38			66.70	03.98			28.69	04.26		

Mean R.A. 21^h 12^m 31^s.16 Mean Dec. +86° 46' 14".73 Sec δ 17.75 Tan δ +17.72

AT UPPER TRANSIT AT GREENWICH

Groombridge 3548 Mag. 7.36

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₂₁ ^m ₁₂ ^s ₈₆ [°] ₄₆	⁺	^h ₂₁ ^m ₁₂ ^s ₈₆ [°] ₄₆	⁺	^h ₂₁ ^m ₁₂ ^s ₈₆ [°] ₄₆	⁺	^h ₂₁ ^m ₁₂ ^s ₈₆ [°] ₄₆	⁺	^h ₂₁ ^m ₁₂ ^s ₈₆ [°] ₄₆	⁺	^h ₂₁ ^m ₁₁ ^s ₈₆ [°] ₄₆	⁺
1	36.50	11.78	39.46	22.28	36.65	33.78	28.95	43.20	17.25	49.48	64.67	50.63
2	36.65	12.09	39.46	22.60	36.51	34.13	28.64	43.50	16.79	49.59	64.24	50.54
3	36.79	12.38	39.47	22.93	36.36	34.50	28.30	43.80	16.33	49.68	63.84	50.45
4	36.94	12.65	39.49	23.27	36.19	34.88	27.93	44.08	15.88	49.76	63.46	50.36
5	37.09	12.93	39.51	23.62	35.99	35.26	27.54	44.35	15.45	49.83	63.10	50.28
6	37.25	13.21	39.53	23.98	35.76	35.62	27.15	44.59	15.04	49.90	62.76	50.21
7	37.43	13.50	39.54	24.36	35.51	35.98	26.76	44.81	14.65	49.98	62.42	50.14
8	37.62	13.80	39.54	24.76	35.24	36.32	26.38	45.01	14.28	50.07	62.06	50.08
9	37.81	14.11	39.52	25.17	34.96	36.64	26.01	45.21	13.91	50.17	61.68	50.03
10	37.99	14.44	{39.47}	{25.58}	34.69	36.94	25.67	45.41	13.53	50.28	61.28	49.98
11	38.16	14.79	{39.39}	{25.98}	34.43	37.24	25.35	45.62	13.13	50.39	60.87	49.91
12	38.32	15.16	39.29	26.37	34.19	37.53	25.03	45.85	12.70	50.49	60.45	49.80
13	38.45	15.53	39.05	27.09	33.97	37.83	24.71	46.09	12.26	50.59	60.04	49.67
14	38.56	15.90	38.94	27.43	33.76	38.15	24.37	46.34	11.80	50.67	59.64	49.53
15	38.64	16.27	38.84	27.75	33.56	38.49	24.00	46.60	11.33	50.72	59.25	49.37
16	38.70	16.63	38.76	28.07	33.35	38.84	23.61	46.85	10.87	50.75	58.89	49.19
17	38.75	16.97	38.70	28.41	33.11	39.19	23.20	47.08	10.43	50.75	58.55	49.02
18	38.80	17.29	38.65	28.77	32.84	39.54	22.78	47.29	10.00	50.74	58.22	48.85
19	38.86	17.60	38.59	29.16	32.55	39.88	22.35	47.47	09.58	50.73	57.91	48.69
20	38.93	17.90	38.51	29.57	32.24	40.21	21.93	47.64	09.18	50.72	57.61	48.54
21	39.02	18.22	38.41	29.99	31.91	40.51	21.52	47.79	08.80	50.71	57.31	48.39
22	39.13	18.56	38.28	30.39	31.58	40.79	21.12	47.93	08.43	50.71	57.00	48.24
23	39.25	18.93	38.13	30.78	31.26	41.06	20.73	48.06	08.06	50.71	56.68	48.10
24	39.35	19.32	37.96	31.14	30.95	41.32	20.36	48.20	07.68	50.72	56.35	47.96
25	39.43	19.72	37.78	31.49	30.65	41.57	20.00	48.35	07.29	50.74	56.01	47.81
26	39.48	20.12	37.59	31.82	30.36	41.82	19.64	48.51	06.89	50.76	55.65	47.64
27	39.51	20.51	37.41	32.14	30.08	42.07	19.28	48.67	06.47	50.78	55.28	47.45
28	39.52	20.89	37.24	32.45	29.80	42.33	18.91	48.84	06.03	50.78	54.92	47.24
29	39.51	21.26	37.08	32.77	29.52	42.61	18.52	49.01	05.57	50.75	54.58	47.01
30	39.49	21.61	36.93	33.10	29.24	42.90	18.11	49.18	05.12	50.70	54.27	46.76
31	39.47	21.95	36.79	33.44	28.95	43.20	17.69	49.34	04.67	50.63	53.99	46.51
32	39.46	22.28	36.65	33.78			17.25	49.48			53.73	46.27

AT UPPER TRANSIT AT GREENWICH

39 H Cephei Mag. 5.62

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m	+	^h ^m	+	^h ^m	+	^h ^m	+	^h ^m	+	^h ^m	+
	23 27	86 57	23 27	86 57	23 27	86 56	23 27	86 56	23 27	86 56	23 27	86 56
1	26.86	20.84	16.07	16.76	10.77	69.16	11.66	59.60	19.18	52.43	31.12	49.82
2	26.50	20.83	15.75	16.57	10.63	68.87	11.81	59.27	19.57	52.24	31.55	49.87
3	26.13	20.83	15.42	16.36	10.49	68.56	12.00	58.95	19.97	52.08	31.95	49.93
4	25.73	20.82	15.09	16.12	10.37	68.23	12.21	58.64	20.36	51.95	32.33	49.98
5	25.30	20.80	14.78	15.86	10.28	67.88	12.44	58.36	20.73	51.83	32.69	50.01
6	24.87	20.75	14.51	15.59	10.23	67.53	12.68	58.11	21.08	51.73	33.05	50.03
7	24.42	20.66	14.28	15.31	10.22	67.19	12.92	57.87	21.42	51.64	33.41	50.04
8	23.98	20.55	14.08	15.03	10.24	66.87	13.15	57.64	21.74	51.54	33.78	50.04
9	23.56	20.43	13.90	14.76	10.27	66.56	13.35	57.41	22.06	51.42	34.17	50.04
10	23.18	20.30	13.73	14.51	10.31	66.27	13.54	57.17	22.37	51.28	34.58	50.05
11	22.83	20.17	13.56	14.28	10.34	65.99	13.72	56.93	22.69	51.13	35.01	50.08
12	22.51	20.04	13.38	14.05	10.35	65.71	13.90	56.68	23.03	50.99	35.45	50.13
13	22.20	19.92	13.17	13.82	10.34	65.42	14.08	56.41	23.39	50.84	35.90	50.20
14	21.89	19.82	12.94	13.58	10.32	65.12	14.27	56.13	23.77	50.70	36.36	50.29
15	21.57	19.73	12.71	13.32	10.30	64.81	14.49	55.85	24.18	50.57	36.81	50.39
16	21.23	19.63	12.48	13.04	10.28	64.49	14.74	55.57	24.60	50.46	37.25	50.51
17	20.87	19.52	12.25	12.74	10.27	64.16	15.01	55.30	25.03	50.36	37.66	50.65
18	20.49	19.39	12.03	12.42	10.27	63.81	15.30	55.04	25.47	50.28	38.04	50.80
19	20.10	19.25	11.84	12.09	10.30	63.46	15.61	54.79	25.90	50.22	38.39	50.94
20	19.71	19.09	11.67	11.76	10.36	63.11	15.93	54.57	26.31	50.19	38.73	51.06
21	19.33	18.91	11.53	11.43	10.45	62.77	16.26	54.37	26.70	50.17	39.07	51.16
22	18.96	18.72	11.42	11.11	10.57	62.44	16.58	54.19	27.06	50.15	39.42	51.25
23	18.60	18.51	11.33	10.80	10.70	62.12	16.88	54.02	27.41	50.12	39.80	51.33
24	18.27	18.29	11.25	10.50	10.84	61.82	17.16	53.85	27.75	50.08	40.20	51.42
25	17.97	18.07	11.18	10.21	10.98	61.54	17.42	53.68	28.09	50.03	40.63	51.53
26	17.70	17.85	11.10	09.93	11.11	61.28	17.67	53.49	28.45	49.96	41.08	51.66
27	17.44	17.64	11.01	09.69	11.23	61.03	17.92	53.29	28.85	49.89	41.53	51.81
28	17.18	17.45	10.90	09.43	11.32	60.78	18.18	53.08	29.28	49.83	41.96	51.99
29	16.92	17.27	10.77	09.16	11.40	60.52	18.47	52.86	29.73	49.79	42.37	52.18
30	16.66	17.09			11.47	60.23	18.81	52.64	30.19	49.78	42.75	52.38
31	16.38	16.92			11.55	59.92	19.18	52.43	30.66	49.79	43.11	52.57
32	16.07	16.76			11.66	59.60			31.12	49.82		

Mean R.A. 23^h 27^m 40^s.17 Mean Dec. +86° 56' 56".34 Sec δ 18.79 Tan δ +18.76

AT UPPER TRANSIT AT GREENWICH

39 H Cephei Mag. 5.62

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₂₃ ^m ₂₇ ^s ₈₆ [°] ₅₆	⁺	^h ₂₃ ^m ₂₇ ^s ₈₆ [°] ₅₇	⁺	^h ₂₃ ^m ₂₇ ^s ₈₆ [°] ₅₇	⁺	^h ₂₃ ^m ₂₇ ^s ₈₆ [°] ₅₇	⁺	^h ₂₃ ^m ₂₇ ^s ₈₆ [°] ₅₇	⁺	^h ₂₃ ^m ₂₇ ^s ₈₆ [°] ₅₇	⁺
1	43.11	52.57	52.91	00.11	58.28	10.77	58.22	22.68	52.45	33.50	42.35	40.45
2	43.44	52.76	53.13	00.39	58.40	11.13	58.16	23.08	52.13	33.82	41.91	40.58
3	43.76	52.95	53.37	00.67	58.52	11.50	58.07	23.49	51.79	34.13	41.49	40.69
4	44.08	53.13	53.62	00.94	58.64	11.88	57.95	23.91	51.45	34.41	41.10	40.79
5	44.40	53.30	53.88	01.22	58.75	12.28	57.80	24.32	51.12	34.66	40.74	40.89
6	44.74	53.46	54.15	01.52	58.84	12.69	57.63	24.72	50.81	34.90	40.40	40.99
7	45.10	53.61	54.43	01.84	58.90	13.10	57.44	25.09	50.53	35.14	40.07	41.11
8	45.47	53.77	54.71	02.18	58.94	13.52	57.25	25.44	50.27	35.38	39.73	41.25
9	45.85	53.96	54.97	02.53	58.94	13.94	57.07	25.77	50.02	35.64	39.37	41.39
10	46.24	54.17	55.20	02.90	58.92	14.35	56.91	26.10	49.77	35.92	38.99	41.54
11	46.64	54.39	55.40	03.28	58.89	14.74	56.78	26.43	49.51	36.21	38.58	41.68
12	47.03	54.62	55.58	03.66	58.86	15.10	56.67	26.77	49.22	36.50	38.14	41.80
13	47.41	54.87	55.73	04.03	{58.86 58.87}	{15.46 15.81}	56.56	27.13	48.90	36.79	37.69	41.89
14	47.76	55.14	55.86	04.38	58.91	16.17	56.44	27.51	48.55	37.07	37.23	41.95
15	48.08	55.42	55.99	04.71	58.97	16.55	56.30	27.90	48.18	37.34	36.78	42.00
16	48.37	55.70	56.13	05.02	59.03	16.95	56.14	28.29	47.80	37.58	36.35	42.03
17	48.64	55.97	56.30	05.33	59.07	17.37	55.94	28.68	47.41	37.79	35.94	42.05
18	48.90	56.23	56.49	05.65	59.08	17.80	55.71	29.06	47.03	37.99	35.54	42.06
19	49.16	56.46	56.70	05.98	59.06	18.23	55.47	29.42	46.67	38.18	35.16	42.06
20	49.44	56.68	56.92	06.34	59.01	18.65	55.21	29.74	46.32	38.36	34.80	42.07
21	49.75	56.90	57.13	06.72	58.94	19.05	54.95	30.04	45.98	38.53	34.44	42.10
22	50.08	57.14	57.32	07.11	58.85	19.44	54.70	30.34	45.65	38.71	34.08	42.14
23	50.43	57.40	57.48	07.52	58.75	19.82	54.46	30.63	45.34	38.90	33.71	42.18
24	50.79	57.68	57.62	07.93	58.65	20.18	54.24	30.92	45.03	39.09	33.32	42.22
25	51.14	57.97	57.73	08.33	58.56	20.52	54.03	31.22	44.71	39.29	32.91	42.27
26	51.47	58.28	57.81	08.71	58.48	20.86	53.83	31.52	44.37	39.50	32.49	42.31
27	51.77	58.60	57.87	09.08	58.42	21.21	53.64	31.82	44.00	39.71	32.04	42.33
28	52.03	58.92	57.93	09.43	58.37	21.56	53.44	32.14	43.62	39.92	31.58	42.32
29	52.27	59.24	58.00	09.77	58.32	21.92	53.23	32.48	43.22	40.12	31.12	42.29
30	52.49	59.54	58.08	10.10	58.27	22.29	53.00	32.83	42.79	40.30	30.68	42.23
31	52.70	59.83	58.17	10.43	58.22	22.68	52.74	33.17	42.35	40.45	30.26	42.16
32	52.91	60.11	58.28	10.77			52.45	33.50			29.88	42.09

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

o Octantis Mag. 7.22

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 0	^m II	^h 0	^m II	^h 0	^m II	^h 0	^m II	^h 0	^m II	^h 0	^m II
	88° 43'		88° 43'		88° 43'		88° 43'		88° 42'		88° 42'	
1	81.86	41.99	54.28	35.38	38.62	25.94	34.69	13.91	43.44	63.03	03.36	54.61
2	80.76	41.84	53.67	35.06	38.40	25.53	34.80	13.56	43.80	62.72	04.12	54.37
3	79.73	41.67	53.10	34.75	38.20	25.14	34.86	13.20	44.17	62.40	04.95	54.13
4	78.77	41.49	52.53	34.45	37.98	24.78	34.87	12.84	44.57	62.06	05.84	53.91
5	77.88	41.30	51.93	34.16	37.72	24.43	34.86	12.46	45.03	61.71	06.76	53.72
6	77.04	41.11	51.28	33.88	37.41	24.09	34.87	12.06	45.56	61.36	07.71	53.54
7	76.22	40.94	50.57	33.61	37.05	23.74	34.93	11.65	46.16	61.01	08.66	53.38
8	75.39	40.80	49.81	33.33	36.65	23.37	35.06	11.23	46.81	60.67	09.58	53.24
9	74.51	40.67	49.02	33.03	36.24	22.98	35.26	10.82	47.51	60.35	10.47	53.11
10	73.57	40.54	48.24	32.70	35.87	22.58	35.53	10.41	48.22	60.06	11.32	52.99
11	72.57	40.40	47.50	32.35	35.56	22.16	35.85	10.01	48.92	59.79	12.13	52.86
12	71.51	40.24	46.83	31.99	35.32	21.74	36.21	09.63	49.60	59.53	12.91	52.73
13	70.44	40.05	46.22	31.62	35.14	21.32	36.58	09.27	50.25	59.28	13.66	52.60
14	69.39	39.84	45.68	31.26	35.03	20.91	36.94	08.93	50.87	59.03	14.41	52.46
15	68.38	39.61	45.20	30.91	34.97	20.51	37.27	08.60	51.45	58.78	15.17	52.31
16	67.43	39.38	44.76	30.57	34.93	20.12	37.57	08.27	52.00	58.53	15.98	52.15
17	66.55	39.14	44.33	30.24	34.90	19.75	37.84	07.94	52.54	58.27	16.86	51.99
18	65.73	38.89	43.90	29.91	34.85	19.38	38.08	07.60	53.09	57.99	17.80	51.83
19	64.95	38.65	43.45	29.59	34.78	19.02	38.30	07.26	53.68	57.70	18.80	51.68
20	64.20	38.42	42.97	29.27	34.68	18.66	38.52	06.90	54.32	57.40	19.84	51.56
21	63.46	38.21	42.46	28.96	34.55	18.30	38.76	06.53	55.04	57.10	20.88	51.46
22	62.70	38.01	41.91	28.64	34.39	17.94	39.06	06.14	55.84	56.81	21.89	51.38
23	61.91	37.80	41.34	28.30	34.21	17.56	39.42	05.74	56.69	56.53	22.83	51.33
24	61.09	37.59	40.76	27.94	34.04	17.17	39.86	05.34	57.57	56.28	23.70	51.29
25	60.23	37.38	40.20	27.56	33.91	16.76	40.37	04.95	58.44	56.06	24.50	51.24
26	59.33	37.15	39.69	27.17	33.85	16.33	40.94	04.58	59.26	55.85	25.27	51.19
27	58.40	36.91	39.25	26.77	33.86	15.90	41.52	04.24	60.02	55.66	26.04	51.12
28	57.48	36.64	38.90	26.36	33.95	15.47	42.08	03.92	60.73	55.48	26.83	51.04
29	56.58	36.35	38.62	25.94	34.12	15.05	42.60	03.62	61.38	55.29	27.68	50.94
30	55.74	36.04			34.32	14.65	43.05	03.33	62.01	55.08	28.59	50.84
31	54.97	35.71			34.52	14.27	43.44	03.03	62.66	54.85	29.56	50.76
32	54.28	35.38			34.69	13.91			63.36	54.61		

Mean R.A. 0^h 12^m 15^s.72 Mean Dec. -88° 43' 27".72 Sec δ 44.92 Tan δ -44.91

AT UPPER TRANSIT AT GREENWICH

o Octantis Mag. 7.22

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 0 12 88° 42'	^h ^m 0 12 88° 42'	^h ^m 0 12 88° 42'	^h ^m 0 12 88° 42'	^h ^m 0 13 88° 42'	^h ^m 0 13 88° 42'	^h ^m 0 13 88° 43'	^h ^m 0 12 88° 43'	^h ^m 0 12 88° 43'	^h ^m 0 12 88° 43'	^h ^m 0 12 88° 43'	^h ^m 0 12 88° 43'
1	29.56	50.76	57.10	52.20	16.65	58.66	21.43	07.91	69.45	16.62	45.01	21.59
2	30.57	50.70	57.96	52.37	16.99	58.96	21.22	08.20	68.90	16.82	44.16	21.68
3	31.60	50.66	58.78	52.55	17.28	59.26	21.04	08.48	68.37	17.04	43.25	21.79
4	32.63	50.65	59.54	52.74	17.55	59.54	20.90	08.75	67.83	17.29	42.27	21.90
5	33.64	50.66	60.24	52.93	17.81	59.81	20.81	09.02	67.24	17.55	41.22	21.99
6	34.62	50.69	60.90	53.11	18.09	60.06	20.74	09.30	66.58	17.81	40.11	22.06
7	35.55	50.72	61.53	53.28	18.41	60.30	20.67	09.60	65.83	18.06	38.97	22.11
8	36.43	50.75	62.15	53.44	18.78	60.53	20.57	09.92	65.00	18.30	37.84	22.14
9	37.27	50.78	62.78	53.59	19.19	60.77	20.40	10.25	64.12	18.52	36.75	22.14
10	38.07	50.80	63.44	53.73	19.61	61.03	20.15	10.59	63.22	18.71	35.72	22.13
11	38.85	50.82	64.15	53.87	20.03	61.32	19.81	10.93	62.33	18.88	34.75	22.12
12	39.64	50.82	64.91	54.01	20.40	61.63	19.39	11.26	61.48	19.03	33.83	22.11
13	40.45	50.81	65.71	54.17	20.69	61.96	18.93	11.56	60.68	19.18	32.93	22.11
14	41.31	50.80	66.53	54.35	20.90	62.30	18.46	11.84	59.93	19.32	32.03	22.12
15	42.23	50.80	67.33	54.55	21.02	62.63	18.01	12.10	59.22	19.47	31.11	22.13
16	43.21	50.81	68.07	54.78	21.07	62.95	17.60	12.35	58.51	19.64	30.16	22.15
17	44.23	50.83	68.73	55.02	21.10	63.25	17.24	12.60	57.79	19.82	29.17	22.17
18	45.26	50.87	69.31	55.27	21.13	63.53	16.91	12.86	57.03	20.01	28.13	22.18
19	46.26	50.94	69.82	55.52	21.18	63.80	16.60	13.13	56.22	20.21	27.04	22.18
20	47.20	51.04	70.28	55.75	21.28	64.06	16.28	13.42	55.35	20.40	25.92	22.16
21	48.07	51.15	70.73	55.97	21.43	64.33	15.93	13.72	54.43	20.59	24.79	22.13
22	48.86	51.27	71.19	56.17	21.61	64.62	15.53	14.03	53.46	20.77	23.66	22.08
23	49.58	51.38	71.70	56.36	21.79	64.92	15.07	14.34	52.46	20.92	22.55	22.00
24	50.29	51.47	72.26	56.56	21.95	65.24	14.56	14.64	51.44	21.05	21.48	21.90
25	51.01	51.55	72.86	56.77	{ 22.08 } { 22.15 }	{ 65.58 } { 65.92 }	13.99	14.94	50.41	21.16	20.47	21.78
26	51.76	51.62	73.49	56.99	22.16	66.27	13.36	15.23	49.40	21.25	19.52	21.66
27	52.57	51.69	74.12	57.23	22.11	66.61	12.69	15.51	48.43	21.32	18.62	21.55
28	53.43	51.76	74.73	57.49	22.00	66.95	12.00	15.77	47.52	21.39	17.75	21.45
29	54.33	51.84	75.29	57.77	21.84	67.28	11.31	16.01	46.66	21.46	16.87	21.36
30	55.26	51.94	75.80	58.06	21.65	67.60	10.65	16.23	45.83	21.52	15.96	21.29
31	56.19	52.06	76.25	58.36	21.43	67.91	10.03	16.43	45.01	21.59	14.99	21.22
32	57.10	52.20	76.65	58.66			09.45	16.62			13.95	21.14

Catalogue Number 13

Spectrum Ao

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

9 B Octantis Mag. 7.76

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 2 ^m 30	^s 86 00	^h 2 ^m 30	^s 86 00	^h 2 ^m 29	^s 86 00	^h 2 ^m 29	^s 86 00	^h 2 ^m 29	^s 86 00	^h 2 ^m 29	^s 85 59
1	24.88	42.11	14.25	42.11	65.14	37.49	57.70	28.40	54.31	17.76	55.29	66.93
2	24.52	42.20	13.92	41.98	64.87	37.21	57.54	28.09	54.24	17.43	55.38	66.59
3	24.17	42.26	13.61	41.85	64.62	36.94	57.36	27.79	54.17	17.08	55.49	66.24
4	23.83	42.30	13.30	41.73	64.37	36.68	57.17	27.48	54.10	16.72	55.62	65.89
5	23.51	42.32	12.99	41.62	64.11	36.44	56.97	27.16	54.04	16.34	55.77	65.54
6	23.20	42.35	12.67	41.52	63.84	36.22	56.77	26.83	54.00	15.95	55.93	65.21
7	22.90	42.39	12.34	41.44	63.55	36.00	56.57	26.49	53.98	15.55	56.10	64.89
8	22.61	42.44	11.99	41.35	63.25	35.77	56.39	26.13	53.99	15.15	56.28	64.59
9	22.31	42.50	11.62	41.25	62.94	35.53	56.23	25.75	54.01	14.76	56.45	64.31
10	21.99	42.57	11.25	41.13	62.63	35.28	56.09	25.36	54.05	14.38	56.61	64.04
11	21.65	42.65	10.88	41.00	62.33	35.00	55.97	24.97	54.09	14.01	56.76	63.78
12	21.29	42.73	10.51	40.85	62.04	34.70	55.86	24.58	54.13	13.66	56.91	63.53
13	20.92	42.80	10.16	40.67	61.77	34.39	55.76	24.21	54.17	13.33	57.05	63.27
14	20.54	42.84	09.83	40.48	61.53	34.07	55.67	23.86	54.20	13.01	57.18	63.00
15	20.16	42.85	09.51	40.28	61.30	33.75	55.58	23.52	54.22	12.70	57.31	62.72
16	19.79	42.84	09.21	40.09	61.08	33.44	55.48	23.19	54.24	12.38	57.46	62.43
17	19.44	42.81	08.92	39.90	60.87	33.14	55.37	22.86	54.25	12.05	57.62	62.12
18	19.10	42.77	08.63	39.72	60.66	32.85	55.26	22.54	54.26	11.70	57.80	61.81
19	18.78	42.72	08.34	39.55	60.45	32.57	55.14	22.21	54.27	11.34	58.00	61.50
20	18.46	42.68	08.05	39.38	60.23	32.30	55.01	21.87	54.29	10.97	58.22	61.20
21	18.15	42.65	07.74	39.22	60.00	32.04	54.88	21.52	54.33	10.58	58.45	60.92
22	17.84	42.63	07.42	39.06	59.76	31.77	54.76	21.14	54.40	10.19	58.69	60.67
23	17.52	42.62	07.09	38.90	59.51	31.49	54.65	20.74	54.49	09.80	58.92	60.44
24	17.19	42.62	06.75	38.72	59.26	31.20	54.57	20.33	54.60	09.43	59.13	60.23
25	16.85	42.62	06.40	38.52	59.01	30.88	54.51	19.92	54.72	09.09	59.32	60.03
26	16.49	42.61	06.06	38.29	58.77	30.54	54.47	19.51	54.83	08.77	59.50	59.83
27	16.12	42.58	05.73	38.04	58.55	30.18	54.44	19.12	54.93	08.47	59.68	59.62
28	15.73	42.53	05.42	37.77	58.35	29.82	54.42	18.76	55.02	08.17	59.86	59.40
29	15.34	42.46	05.14	37.49	58.17	29.44	54.40	18.41	55.09	07.87	60.05	59.17
30	14.96	42.37			58.01	29.07	54.36	18.08	55.16	07.57	60.26	58.92
31	14.60	42.25			57.86	28.72	54.31	17.76	55.22	07.26	60.49	58.66
32	14.25	42.11			57.70	28.40			55.29	06.93		

Mean R.A. 2^h 30^m 14^s.91 Mean Dec. - 86° 00' 31".31 Sec δ 14.37 Tan δ - 14.33

AT UPPER TRANSIT AT GREENWICH

9 B Octantis Mag. 7.76

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}
	2 30 85 59	—	2 30 85 59	—	2 30 85 59	—	2 30 86 00	—	2 30 86 00	—	2 30 86 00	—
1	00.49	58.66	08.86	54.50	17.73	56.06	23.99	02.52	25.77	12.40	22.15	21.32
2	00.74	58.41	09.18	54.47	17.98	56.24	24.10	02.82	25.75	12.68	21.98	21.57
3	01.00	58.19	09.50	54.46	18.21	56.43	24.21	03.10	25.73	12.97	21.80	21.84
4	01.27	57.98	09.80	54.46	18.44	56.61	24.32	03.36	25.72	13.27	21.60	22.11
5	01.55	57.78	10.09	54.47	18.66	56.76	24.44	03.61	25.70	13.59	21.37	22.38
6	01.82	57.60	10.37	54.50	18.88	56.91	24.56	03.85	25.66	13.94	21.12	22.65
7	02.09	57.44	10.64	54.52	19.10	57.06	24.70	04.10	25.60	14.30	20.85	22.91
8	02.35	57.30	10.90	54.53	19.34	57.20	24.85	04.37	25.51	14.67	20.58	23.15
9	02.60	57.16	11.16	54.53	19.59	57.33	25.00	04.66	25.40	15.03	20.30	23.36
10	02.83	57.03	11.42	54.52	19.86	57.47	25.13	04.97	25.27	15.37	20.03	23.56
11	03.05	56.89	11.69	54.50	20.13	57.63	25.25	05.30	25.14	15.68	19.78	23.74
12	03.28	56.74	11.98	54.47	20.40	57.81	25.34	05.64	25.01	15.97	19.54	23.91
13	03.51	56.58	12.29	54.44	20.65	58.03	25.41	05.98	24.89	16.24	19.31	24.09
14	03.75	56.41	12.62	54.43	20.88	58.27	25.45	06.32	24.78	16.50	19.09	24.28
15	04.00	56.22	12.95	54.45	21.09	58.52	25.48	06.64	24.68	16.77	18.86	24.47
16	04.28	56.03	13.27	54.50	21.28	58.77	25.51	06.95	24.58	17.05	18.62	24.67
17	04.58	55.85	13.58	54.57	21.45	59.00	25.54	07.24	24.49	17.35	18.36	24.88
18	04.89	55.70	13.87	54.66	21.61	59.22	25.59	07.52	24.40	17.66	18.09	25.10
19	05.20	55.58	14.13	54.76	21.78	59.44	25.65	07.80	24.29	17.97	17.81	25.32
20	05.50	55.48	14.38	54.85	21.96	59.65	25.72	08.09	24.16	18.29	17.52	25.54
21	05.79	55.40	14.62	54.94	22.15	59.84	25.79	08.39	24.02	18.62	17.21	25.74
22	06.06	55.33	14.87	55.02	22.36	60.03	25.86	08.70	23.86	18.95	16.89	25.91
23	06.32	55.27	15.12	55.09	22.58	60.24	25.92	09.03	23.68	19.27	16.56	26.07
24	06.57	55.20	15.39	55.15	22.80	60.47	25.97	09.38	23.48	19.58	16.24	26.21
25	06.81	55.12	15.67	55.21	23.01	60.72	26.00	09.74	23.28	19.87	15.93	26.32
26	07.06	55.03	15.97	55.28	23.21	61.00	26.01	10.10	23.07	20.14	15.62	26.41
27	07.32	54.93	16.27	55.37	23.40	61.29	26.00	10.46	22.87	20.40	15.33	26.48
28	07.60	54.82	16.58	55.47	23.57	61.59	25.98	10.81	22.67	20.64	15.05	26.56
29	07.90	54.72	16.88	55.59	23.73	61.90	25.94	11.16	22.49	20.87	14.78	26.66
30	08.21	54.63	17.18	55.74	23.87	62.21	{ 25.89 } { 25.84 }	{ 11.50 } { 11.82 }	22.32	21.09	14.50	26.79
31	08.53	54.56	17.46	55.90	23.99	62.52	25.80	12.12	22.15	21.32	14.21	26.93
32	08.86	54.50	17.73	56.06			25.77	12.40			13.90	27.07

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

10 B Octantis Mag. 8.35

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 2 ^m 45	^s 88 ^m 26	^h 2 ^m 44	^s 88 ^m 25	^h 2 ^m 44	^s 88 ^m 25	^h 2 ^m 44	^s 88 ^m 25	^h 2 ^m 44	^s 88 ^m 25	^h 2 ^m 44	^s 88 ^m 25
1	31.68	03.33	64.09	63.90	39.83	59.82	19.26	51.22	08.72	40.91	09.16	30.16
2	30.76	03.44	63.20	63.78	39.09	59.55	18.81	50.92	08.49	40.59	09.30	29.82
3	29.84	03.52	62.36	63.67	38.39	59.29	18.31	50.63	08.24	40.25	09.50	29.47
4	28.95	03.58	61.55	63.57	37.71	59.06	17.77	50.34	07.99	39.89	09.75	29.12
5	28.11	03.62	60.75	63.48	37.02	58.85	17.20	50.04	07.77	39.52	10.06	28.77
6	27.31	03.66	59.93	63.41	36.30	58.64	16.62	49.73	07.59	39.13	10.41	28.42
7	26.54	03.70	59.06	63.34	35.53	58.44	16.05	49.40	07.47	38.74	10.78	28.09
8	25.79	03.76	58.14	63.27	34.72	58.24	15.51	49.06	07.41	38.34	11.17	27.78
9	25.03	03.84	57.17	63.19	33.88	58.02	15.02	48.69	07.39	37.95	11.55	27.49
10	24.22	03.93	56.18	63.09	33.04	57.78	14.59	48.31	07.41	37.58	11.92	27.22
11	23.35	04.03	55.19	62.98	32.21	57.53	14.21	47.93	07.45	37.21	12.27	26.97
12	22.43	04.13	54.22	62.84	31.42	57.25	13.87	47.56	07.49	36.85	12.60	26.72
13	21.47	04.21	53.28	62.68	30.68	56.95	13.56	47.20	07.53	36.51	12.90	26.46
14	20.49	04.27	52.39	62.51	29.99	56.64	13.27	46.86	07.57	36.19	13.18	26.19
15	19.51	04.30	51.55	62.33	29.35	56.34	12.98	46.52	07.59	35.88	13.45	25.91
16	18.55	04.31	50.74	62.15	28.74	56.05	12.68	46.19	07.58	35.57	13.73	25.62
17	17.62	04.31	49.96	61.98	28.16	55.77	12.36	45.87	07.54	35.25	14.05	25.31
18	16.73	04.29	49.19	61.82	27.58	55.49	12.01	45.56	07.49	34.92	14.43	25.00
19	15.88	04.27	48.43	61.67	27.00	55.22	11.64	45.24	07.44	34.57	14.88	24.69
20	15.06	04.25	47.65	61.52	26.40	54.97	11.25	44.91	07.42	34.20	15.38	24.38
21	14.25	04.23	46.84	61.38	25.77	54.72	10.85	44.57	07.44	33.82	15.92	24.08
22	13.44	04.22	46.00	61.24	25.12	54.46	10.47	44.21	07.52	33.43	16.47	23.80
23	12.61	04.21	45.13	61.10	24.44	54.20	10.12	43.83	07.67	33.04	17.00	23.56
24	11.77	04.22	44.22	60.94	23.74	53.92	09.82	43.43	07.88	32.67	17.50	23.34
25	10.89	04.24	43.29	60.76	23.04	53.62	09.59	43.02	08.11	32.32	17.95	23.13
26	09.97	04.25	42.37	60.55	22.36	53.30	09.42	42.62	08.34	31.99	18.37	22.93
27	09.01	04.25	41.47	60.32	21.71	52.96	09.29	42.24	08.55	31.68	18.77	22.72
28	08.02	04.23	40.62	60.08	21.12	52.60	09.18	41.88	08.72	31.38	19.17	22.50
29	07.01	04.18	39.83	59.82	20.60	52.23	09.06	41.54	08.86	31.09	19.59	22.26
30	06.00	04.11			20.13	51.87	08.91	41.22	08.97	30.79	20.05	22.00
31	05.02	04.01			19.69	51.53	08.72	40.91	09.06	30.48	20.57	21.74
32	04.09	03.90			19.26	51.22			09.16	30.16		

Mean R.A. 2^h 45^m 06^s.05 Mean Dec. -88° 25' 53".19 Sec δ 36.53 Tan δ -36.52

AT UPPER TRANSIT AT GREENWICH

10 B Octantis Mag. 8.35

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s 2 44 88 25	—	^h ^m ^s 2 44 88 25	—	^h ^m ^s 2 45 88 25	—	^h ^m ^s 2 45 88 25	—	^h ^m ^s 2 45 88 25	—	^h ^m ^s 2 44 88 25	—
1	20.57	21.74	40.65	17.22	02.97	18.32	19.54	24.38	25.27	33.82	76.96	43.14
2	21.14	21.49	41.46	17.18	03.63	18.49	19.86	24.67	25.21	34.11	76.56	43.39
3	21.75	21.25	42.25	17.15	04.25	18.65	20.16	24.95	{25.17 25.16}	{34.39 34.67}	76.13	43.66
4	22.39	21.03	43.01	17.14	04.84	18.81	20.46	25.22	25.17	34.98	75.66	43.96
5	23.05	20.83	43.74	17.14	05.41	18.96	20.78	25.47	25.16	35.30	75.13	44.27
6	23.71	20.65	44.44	17.15	05.97	19.10	21.13	25.70	25.12	35.64	74.53	44.56
7	24.36	20.48	45.11	17.16	06.54	19.23	21.51	25.93	25.02	35.99	73.87	44.83
8	24.98	20.32	45.76	17.16	07.14	19.35	21.91	26.17	24.84	36.35	73.17	45.07
9	25.57	20.17	46.40	17.15	07.78	19.47	22.32	26.44	24.60	36.71	72.47	45.29
10	26.14	20.03	47.04	17.13	08.45	19.60	22.71	26.75	24.31	37.05	71.79	45.49
11	26.68	19.88	47.70	17.10	09.15	19.74	23.05	27.08	24.00	37.37	71.15	45.68
12	27.20	19.71	48.40	17.06	09.85	19.91	23.33	27.42	23.69	37.67	70.54	45.86
13	27.73	19.53	49.15	17.01	10.53	20.11	23.54	27.76	23.40	37.96	69.95	46.04
14	28.28	19.34	49.95	16.98	11.16	20.34	23.69	28.09	23.14	38.23	69.38	46.24
15	28.87	19.15	50.78	16.98	11.72	20.59	23.80	28.41	22.92	38.50	68.82	46.45
16	29.52	18.95	51.60	17.01	12.22	20.82	23.90	28.71	22.72	38.78	68.24	46.67
17	30.22	18.76	52.39	17.07	12.68	21.05	24.02	29.00	22.52	39.07	67.63	46.90
18	30.96	18.59	53.13	17.14	13.12	21.27	24.16	29.28	22.30	39.38	66.98	47.13
19	31.72	18.44	53.82	17.23	13.56	21.47	24.34	29.55	22.06	39.70	66.29	47.35
20	32.47	18.32	54.46	17.32	14.02	21.66	24.55	29.83	21.79	40.03	65.55	47.57
21	33.19	18.23	55.07	17.40	14.52	21.85	24.77	30.12	21.47	40.37	64.77	47.78
22	33.87	18.16	55.68	17.46	15.06	22.03	24.99	30.43	21.10	40.71	63.96	47.97
23	34.50	18.10	56.31	17.50	15.63	22.22	25.19	30.75	20.68	41.04	63.14	48.15
24	35.09	18.03	56.97	17.54	16.21	22.43	25.36	31.09	20.22	41.35	62.32	48.30
25	35.67	17.94	57.67	17.59	16.79	22.67	25.49	31.44	19.73	41.64	61.51	48.43
26	36.26	17.83	58.42	17.65	17.35	22.93	25.57	31.80	19.23	41.92	60.73	48.54
27	36.89	17.72	59.20	17.71	17.88	23.20	25.60	32.16	18.73	42.18	59.98	48.64
28	37.57	17.60	59.98	17.79	18.36	23.48	25.58	32.52	18.24	42.43	59.26	48.74
29	38.29	17.48	60.76	17.88	18.80	23.78	25.52	32.88	17.78	42.67	58.57	48.86
30	39.05	17.37	61.53	18.00	19.19	24.08	25.44	33.22	17.36	42.90	57.88	48.99
31	39.84	17.28	62.27	18.15	19.54	24.38	25.35	33.53	16.96	43.14	57.15	49.14
32	40.65	17.22	62.97	18.32			25.27	33.82			56.36	49.29

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

31 G Mensæ Mag. 6.24

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 5 ^m 42 ^s 84 49	—	^h 5 ^m 42 ^s 84 49	—	^h 5 ^m 42 ^s 84 49	—	^h 5 ^m 42 ^s 84 49	—	^h 5 ^m 42 ^s 84 49	—	^h 5 ^m 42 ^s 84 49	—
1	56.68	23.16	51.21	31.80	43.99	36.00	35.23	35.89	27.78	31.50	22.61	23.58
2	56.54	23.51	50.96	31.97	43.70	36.03	34.98	35.80	27.57	31.34	22.48	23.28
3	56.39	23.84	50.73	32.13	43.42	36.06	34.72	35.73	27.35	31.16	22.35	22.96
4	56.24	24.15	50.51	32.29	43.15	36.10	34.45	35.67	27.13	30.96	22.24	22.62
5	56.09	24.43	50.29	32.47	42.89	36.14	34.18	35.62	26.90	30.75	22.14	22.27
6	55.95	24.69	50.07	32.67	42.63	36.19	33.90	35.56	26.68	30.52	22.05	21.93
7	55.82	24.95	49.85	32.88	42.36	36.27	33.61	35.49	26.46	30.28	21.97	21.60
8	55.69	25.23	49.62	33.10	42.08	36.37	33.32	35.39	26.25	30.02	21.91	21.27
9	55.57	25.53	49.38	33.33	41.79	36.46	33.04	35.27	26.05	29.74	21.85	20.95
10	55.44	25.84	49.12	33.56	41.49	36.54	32.76	35.12	25.87	29.46	21.80	20.64
11	55.31	26.17	48.85	33.77	41.18	36.60	32.49	34.96	25.70	29.19	21.75	20.35
12	55.16	26.51	48.58	33.96	40.88	36.63	32.23	34.79	25.54	28.92	21.69	20.07
13	55.00	26.86	48.30	34.12	40.58	36.64	31.99	34.63	25.38	28.66	21.63	19.79
14	54.83	27.19	48.03	34.26	40.28	36.62	31.75	34.47	25.22	28.42	21.56	19.51
15	54.64	27.51	47.76	34.38	39.99	36.59	31.51	34.32	25.07	28.19	21.49	19.22
16	54.45	27.80	47.50	34.49	39.71	36.55	31.28	34.17	24.91	27.96	21.42	18.92
17	54.26	28.06	47.25	34.60	39.44	36.52	31.05	34.03	24.74	27.74	21.35	18.60
18	54.07	28.31	47.00	34.71	39.17	36.50	30.82	33.91	24.57	27.51	21.28	18.25
19	53.88	28.55	46.76	34.82	38.91	36.49	30.58	33.80	24.39	27.27	21.22	17.89
20	53.70	28.78	46.51	34.95	38.65	36.48	30.33	33.68	24.21	27.02	21.18	17.53
21	53.52	29.02	46.26	35.09	38.38	36.49	30.08	33.54	24.03	26.74	21.16	17.17
22	53.35	29.26	46.01	35.23	38.11	36.50	29.82	33.39	23.86	26.43	21.16	16.82
23	53.17	29.50	45.75	35.38	37.83	36.50	29.56	33.21	23.70	26.11	21.16	16.49
24	52.99	29.75	45.48	35.53	37.54	36.50	29.30	33.01	23.56	25.78	21.16	16.18
25	52.81	30.02	45.19	35.67	37.24	36.49	29.05	32.78	23.44	25.46	21.16	15.90
26	52.62	30.31	44.89	35.79	36.93	36.46	28.81	32.54	23.33	25.15	21.15	15.64
27	52.42	30.60	44.59	35.89	36.62	36.40	28.59	32.31	23.22	24.87	21.14	15.37
28	52.20	30.88	44.29	35.96	36.32	36.31	28.38	32.08	23.11	24.60	21.12	15.08
29	51.96	31.14	43.99	36.00	36.03	36.20	28.18	31.86	22.99	24.35	21.10	14.77
30	51.72	31.38			35.75	36.08	27.98	31.67	22.87	24.10	21.09	14.44
31	51.47	31.60			35.49	35.98	27.78	31.50	22.74	23.85	21.08	14.10
32	51.21	31.80			35.23	35.89			22.61	23.58		

Mean R.A. 5^h 42^m 45^s.19 Mean Dec. —84° 49' 22".86 Sec δ 11.08 Tan δ —11.04

APPARENT PLACES OF STARS, 1935

335

AT UPPER TRANSIT AT GREENWICH

31 G Mensæ Mag. 6.24

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₅ ^m ₄₂	[°] ₈₄ ['] ₄₉	^h ₅ ^m ₄₂	[°] ₈₄ ['] ₄₈	^h ₅ ^m ₄₂	[°] ₈₄ ['] ₄₈	^h ₅ ^m ₄₂	[°] ₈₄ ['] ₄₈	^h ₅ ^m ₄₂	[°] ₈₄ ['] ₄₉	^h ₅ ^m ₄₂	[°] ₈₄ ['] ₄₉
1	21.08	14.10	23.44	64.94	29.11	59.21	36.00	58.79	42.25	04.05	45.39	13.11
2	21.09	13.75	23.60	64.67	29.34	59.13	36.22	58.91	42.39	04.28	45.43	13.41
3	21.11	13.40	23.76	64.42	29.56	59.07	36.43	59.02	42.54	04.49	45.48	13.72
4	21.15	13.06	23.92	64.19	29.78	59.02	36.64	59.11	42.69	04.70	45.53	14.05
5	21.19	12.72	24.09	63.98	29.99	58.97	36.84	59.19	42.85	04.93	45.58	14.41
6	21.24	12.39	24.25	63.78	30.19	58.90	37.05	59.27	43.01	05.17	45.62	14.79
7	21.30	12.08	24.41	63.59	30.39	58.82	37.27	59.34	43.18	05.44	45.64	15.19
8	21.37	11.79	24.56	63.39	30.59	58.73	37.49	59.41	43.34	05.74	45.65	15.59
9	21.43	11.51	24.70	63.19	30.80	58.62	37.72	59.49	43.49	06.06	45.64	15.97
10	21.48	11.24	24.84	62.98	31.03	58.51	37.96	59.60	43.63	06.39	45.62	16.34
11	21.53	10.97	24.98	62.76	31.26	58.42	38.20	59.73	43.75	06.72	45.59	16.69
12	21.58	10.69	25.13	62.52	31.50	58.35	38.43	59.90	43.86	07.05	45.56	17.02
13	21.62	10.41	25.29	62.27	31.75	58.30	38.65	60.10	43.95	07.37	45.53	17.34
14	21.66	10.11	25.46	62.02	32.01	58.28	38.86	60.31	44.04	07.67	45.51	17.65
15	21.70	09.79	25.65	61.79	32.25	58.29	39.06	60.51	44.14	07.95	45.49	17.97
16	21.75	09.45	25.85	61.58	32.48	58.31	39.24	60.69	44.24	08.22	45.48	18.29
17	21.82	09.11	26.05	61.39	32.71	58.34	39.42	60.86	44.35	08.49	45.47	18.62
18	21.91	08.77	26.25	61.22	32.93	58.37	39.61	61.02	44.46	08.77	{45.45}	{18.97}
											{45.43}	{19.34}
19	22.01	08.45	26.45	61.07	33.14	58.39	39.80	61.17	44.58	09.06	45.40	19.72
20	22.12	08.15	26.64	60.94	33.35	58.39	39.99	61.32	44.69	09.36	45.36	20.10
21	22.23	07.87	26.82	60.82	33.56	58.37	40.19	61.48	44.80	09.68	45.30	20.48
22	22.34	07.61	27.00	60.70	33.78	58.35	40.40	61.65	44.91	10.02	45.23	20.86
23	22.45	07.37	27.17	60.56	34.02	58.33	40.62	61.83	45.01	10.38	45.15	21.23
24	22.55	07.13	27.35	60.40	34.26	58.33	40.83	62.03	45.09	10.75	45.06	21.59
25	22.65	06.89	27.54	60.22	34.51	58.35	41.04	62.25	45.15	11.12	44.96	21.93
26	22.74	06.65	27.74	60.03	34.76	58.37	41.24	62.49	45.21	11.49	44.86	22.24
27	22.83	06.40	27.95	59.85	35.02	58.41	41.43	62.75	45.26	11.85	44.76	22.53
28	22.93	06.12	28.17	59.69	35.28	58.48	41.62	63.02	45.29	12.18	44.67	22.83
29	23.04	05.82	28.40	59.54	35.53	58.57	41.79	63.29	45.32	12.50	44.59	23.13
30	23.16	05.51	28.63	59.41	35.77	58.67	41.95	63.55	45.35	12.81	44.51	23.44
31	23.29	05.22	28.87	59.30	36.00	58.79	42.10	63.80	45.39	13.11	44.43	23.76
32	23.44	04.94	29.11	59.21			42.25	64.05			44.34	24.11

AT UPPER TRANSIT AT GREENWICH

12 B Octantis Mag. 6.74

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s 5 57 85 55	—	^h ^m ^s 5 56 85 56	—	^h ^m ^s 5 56 85 56	—	^h ^m ^s 5 56 85 56	—	^h ^m ^s 5 56 85 56	—	^h ^m ^s 5 56 85 55	—
1	13.00	56.92	66.45	05.99	57.44	10.79	46.25	11.38	36.49	07.69	29.40	60.30
2	12.84	57.29	66.15	06.18	57.07	10.85	45.92	11.32	36.21	07.54	29.21	60.02
3	12.67	57.63	65.85	06.36	56.71	10.90	45.59	11.28	35.92	07.39	29.03	59.72
4	12.49	57.95	65.57	06.55	56.37	10.96	45.26	11.26	35.62	07.23	28.86	59.39
5	12.31	58.24	65.30	06.74	56.04	11.03	44.91	11.23	35.32	07.04	28.71	59.05
6	12.14	58.52	65.04	06.95	55.71	11.11	44.55	11.20	35.02	06.83	28.58	58.72
7	11.98	58.79	64.77	07.18	55.37	11.21	44.17	11.15	34.72	06.60	28.46	58.39
8	11.83	59.07	64.49	07.42	55.02	11.33	43.79	11.07	34.44	06.35	28.35	58.07
9	11.69	59.36	64.19	07.67	54.66	11.44	43.42	10.97	34.17	06.09	28.26	57.76
10	11.55	59.68	63.87	07.91	54.29	11.54	43.06	10.85	33.92	05.83	28.17	57.46
11	11.40	60.02	63.54	08.14	53.90	11.62	42.71	10.72	33.69	05.59	28.09	57.18
12	11.23	60.37	63.20	08.35	53.51	11.67	42.37	10.58	33.47	05.34	28.00	56.91
13	11.04	60.72	62.85	08.53	53.12	11.70	42.04	10.44	33.25	05.09	27.91	56.64
14	10.83	61.06	62.51	08.68	52.73	11.71	41.73	10.30	33.04	04.85	27.81	56.37
15	10.61	61.39	62.18	08.82	52.36	11.70	41.42	10.16	32.83	04.63	27.70	56.09
16	10.38	61.70	61.85	08.96	52.00	11.69	41.12	10.03	32.61	04.43	27.58	55.80
17	10.14	61.98	61.53	09.09	51.66	11.69	40.82	09.92	32.38	04.23	27.46	55.49
18	09.91	62.24	61.22	09.22	51.32	11.69	40.51	09.82	32.14	04.03	27.35	55.16
19	09.68	62.48	60.92	09.36	50.98	11.69	40.20	09.72	31.90	03.81	27.26	54.81
20	09.46	62.72	60.61	09.50	50.65	11.70	39.88	09.62	31.65	03.57	27.19	54.45
21	09.24	62.97	60.30	09.65	50.31	11.72	39.54	09.51	31.40	03.30	27.14	54.10
22	09.03	63.22	59.99	09.82	49.97	11.75	39.20	09.38	31.17	03.01	27.11	53.76
23	08.82	63.48	59.66	10.00	49.61	11.78	38.85	09.23	30.95	02.69	27.09	53.44
24	08.61	63.76	59.32	10.17	49.24	11.80	38.51	09.05	30.75	02.37	27.08	53.14
25	08.40	64.05	58.96	10.33	48.86	11.82	38.18	08.85	30.57	02.06	27.06	52.86
26	08.17	64.35	58.59	10.48	48.46	11.82	37.87	08.63	30.41	01.78	27.04	52.59
27	07.92	64.66	58.21	10.61	48.06	11.79	37.57	08.41	30.25	01.52	27.00	52.31
28	07.65	64.96	57.82	10.71	47.67	11.73	37.29	08.20	30.10	01.27	26.95	52.02
29	07.37	65.25	57.44	10.79	47.29	11.65	37.02	08.01	29.94	01.03	26.91	51.72
30	07.07	65.52			46.93	11.55	36.76	07.84	29.77	00.79	26.87	51.40
31	06.76	65.77			46.58	11.46	36.49	07.69	29.59	00.55	26.84	51.07
32	06.45	65.99			46.25	11.38			29.40	00.30		

Mean R.A. 5^h 56^m 58^s.66 Mean Dec. -85° 55' 57".54 Sec δ 14.10 Tan δ -14.06

AT UPPER TRANSIT AT GREENWICH

12 B Octantis Mag. 6.74

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 5 ^m 56 ^s 85 ⁵⁵	—	^h 5 ^m 56 ^s 85 ⁵⁵	—	^h 5 ^m 56 ^s 85 ⁵⁵	—	^h 5 ^m 56 ^s 85 ⁵⁵	—	^h 5 ^m 56 ^s 85 ⁵⁵	—	^h 5 ^m 56 ^s 85 ⁵⁵	—
1	26.84	51.07	29.23	41.81	36.03	35.67	44.71	34.72	52.87	39.45	57.29	48.20
2	26.82	50.72	29.42	41.53	36.32	35.58	45.00	34.82	53.06	39.67	57.36	48.49
3	26.82	50.37	29.61	41.27	36.61	35.51	45.27	34.91	53.26	39.87	57.44	48.81
4	26.84	50.02	29.80	41.03	36.88	35.44	45.53	34.99	53.47	40.07	57.52	49.14
5	26.88	49.67	30.00	40.80	37.14	35.36	45.79	35.06	53.68	40.28	57.60	49.49
6	26.93	49.34	30.19	40.58	37.39	35.27	46.06	35.12	53.90	40.51	57.67	49.86
7	26.99	49.03	30.38	40.37	37.64	35.18	46.33	35.17	54.13	40.76	57.72	50.25
8	27.05	48.74	30.56	40.17	37.89	35.08	46.61	35.22	54.35	41.04	57.74	50.65
9	27.10	48.46	30.72	39.97	38.15	34.96	46.91	35.28	54.56	41.35	57.74	51.04
10	27.16	48.18	30.88	39.75	38.42	34.84	47.22	35.37	54.75	41.67	57.73	51.41
11	27.21	47.91	31.04	39.52	38.71	34.73	47.54	35.49	54.92	41.99	57.71	51.76
12	27.25	47.63	31.21	39.27	39.01	34.64	47.85	35.64	55.07	42.31	57.68	52.10
13	27.28	47.35	31.40	39.01	39.32	34.58	48.14	35.81	55.20	42.62	57.66	52.42
14	27.31	47.06	31.60	38.75	39.64	34.54	48.41	36.00	55.33	42.91	57.65	52.73
15	27.34	46.75	31.82	38.50	39.96	34.52	48.66	36.19	55.46	43.18	57.65	53.04
16	27.38	46.42	32.06	38.27	40.26	34.52	48.91	36.36	55.60	43.44	57.65	53.36
17	27.44	46.07	32.31	38.06	40.54	34.54	49.15	36.52	55.75	43.70	57.65	53.69
18	27.53	45.72	32.56	37.88	40.81	34.56	49.39	36.66	55.91	43.96	57.65	54.03
19	27.64	45.39	32.80	37.73	41.07	34.56	49.63	36.79	56.07	44.24	57.64	54.40
20	27.76	45.08	33.03	37.59	41.34	34.54	49.88	36.92	56.23	44.53	57.62	54.78
21	27.89	44.80	33.25	37.46	41.61	34.51	50.15	37.05	56.39	44.84	{ 57.58 } { 57.53 }	{ 55.17 } { 55.16 }
22	28.02	44.54	33.46	37.32	41.89	34.47	50.42	37.20	56.54	45.17	57.46	55.94
23	28.14	44.29	33.67	37.16	42.18	34.44	50.70	37.37	56.68	45.52	57.38	56.32
24	28.25	44.05	33.89	36.99	42.49	34.41	50.98	37.55	56.80	45.87	57.28	56.68
25	28.35	43.81	34.11	36.80	42.81	34.40	51.26	37.75	56.91	46.23	57.17	57.02
26	28.45	43.56	34.35	36.61	43.13	34.40	51.53	37.98	57.00	46.59	57.05	57.34
27	28.55	43.29	34.60	36.42	43.46	34.42	51.79	38.22	57.07	46.95	56.94	57.65
28	28.65	43.01	34.87	36.23	43.78	34.47	52.04	38.47	57.13	47.29	56.84	57.95
29	28.77	42.71	35.15	36.06	44.10	34.54	52.27	38.72	57.18	47.61	56.75	58.25
30	28.91	42.40	35.44	35.91	44.41	34.62	52.48	38.97	57.23	47.91	56.66	58.56
31	29.06	42.10	35.74	35.78	44.71	34.72	52.68	39.22	57.29	48.20	56.58	58.89
32	29.23	41.81	36.03	35.67			52.87	39.45			56.49	59.25

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

A Octantis Mag. 7.75

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 7 ^m 26 ^s 88 ^s 39	—	^h 7 ^m 25 ^s 88 ^s 39	—	^h 7 ^m 25 ^s 88 ^s 39	—	^h 7 ^m 24 ^s 88 ^s 39	—	^h 7 ^m 24 ^s 88 ^s 39	—	^h 7 ^m 23 ^s 88 ^s 39	—
1	09.78	13.03	60.24	24.44	39.56	32.49	68.44	37.60	36.82	38.19	68.67	34.39
2	09.76	13.43	59.55	24.74	38.56	32.70	67.47	37.68	35.87	38.17	67.82	34.22
3	09.67	13.83	58.90	25.03	37.61	32.89	66.51	37.78	34.88	38.16	66.97	34.02
4	09.51	14.22	58.30	25.31	36.72	33.08	65.52	37.89	33.84	38.14	66.14	33.80
5	09.30	14.58	57.74	25.60	35.87	33.28	64.49	38.00	32.76	38.10	65.35	33.56
6	09.08	14.92	57.22	25.91	35.04	33.50	63.42	38.11	31.66	38.03	64.61	33.32
7	08.87	15.25	56.70	26.23	34.20	33.73	62.30	38.22	30.57	37.94	63.93	33.08
8	08.69	15.57	56.16	26.57	33.33	33.97	61.14	38.31	29.50	37.83	63.29	32.83
9	08.56	15.89	55.57	26.92	32.41	34.21	59.96	38.37	28.47	37.71	62.70	32.58
10	08.48	16.21	54.92	27.27	31.42	34.45	58.79	38.41	27.49	37.58	62.14	32.34
11	08.41	16.56	54.20	27.61	30.39	34.69	57.64	38.43	26.55	37.44	61.60	32.12
12	{ 08.33 } { 08.21 }	{ 16.44 } { 17.34 }	53.43	27.94	29.32	34.90	56.53	38.44	25.67	37.31	61.06	31.91
13	08.03	17.74	52.63	28.25	28.24	35.09	55.46	38.43	24.81	37.19	60.50	31.71
14	07.79	18.14	51.82	28.53	27.17	35.26	54.42	38.43	23.97	37.07	59.92	31.51
15	07.48	18.53	51.01	28.79	26.11	35.42	53.42	38.44	23.14	36.96	59.30	31.31
16	07.12	18.91	50.22	29.04	25.08	35.56	52.45	38.45	22.30	36.86	58.64	31.10
17	06.73	19.27	49.45	29.29	24.09	35.69	51.49	38.47	21.43	36.76	57.96	30.87
18	06.32	19.62	48.71	29.54	23.13	35.82	50.52	38.50	20.52	36.67	57.27	30.61
19	05.92	19.94	47.99	29.80	22.19	35.95	49.53	38.54	19.58	36.58	56.61	30.33
20	05.54	20.25	47.29	30.06	21.27	36.09	48.50	38.58	18.60	36.47	56.02	30.04
21	05.18	20.56	46.59	30.33	20.35	36.25	47.42	38.61	17.60	36.33	55.50	29.75
22	04.84	20.88	45.88	30.61	19.41	36.42	46.29	38.63	16.60	36.15	55.05	29.45
23	04.52	21.21	45.14	30.90	18.43	36.59	45.13	38.64	15.63	35.95	54.66	29.16
24	04.21	21.55	44.35	31.20	17.40	36.77	43.96	38.62	14.73	35.75	54.31	28.90
25	03.89	21.91	43.49	31.50	16.32	36.95	42.80	38.58	13.91	35.55	53.97	28.66
26	03.54	22.27	42.57	31.79	15.18	37.11	41.67	38.51	13.15	35.35	53.61	28.42
27	03.15	22.64	41.59	32.05	14.01	37.24	40.60	38.43	12.44	35.16	53.21	28.19
28	02.70	23.02	40.58	32.29	12.82	37.34	39.60	38.35	11.74	34.99	52.76	27.95
29	02.17	23.40	39.56	32.49	11.65	37.42	38.66	38.28	11.03	34.84	52.28	27.70
30	01.57	23.77			10.53	37.49	37.74	38.23	10.29	34.70	51.80	27.43
31	00.92	24.12			09.46	37.54	36.82	38.19	09.50	34.55	51.34	27.15
32	00.24	24.44			08.44	37.60			08.67	34.39		

Mean R.A. 7^h 25^m 32^s.09 Mean Dec. -88° 39' 19".42 Sec δ 42.62 Tan δ -42.60

AT UPPER TRANSIT AT GREENWICH

A Octantis Mag. 7.75

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s	^h ^m ^s	^h ^m ^s	^h ^m ^s	^h ^m ^s	^h ^m ^s	^h ^m ^s	^h ^m ^s	^h ^m ^s	^h ^m ^s	^h ^m ^s	^h ^m ^s
	7 23 88 39	7 23 88 39	7 23 88 39	7 23 88 39	7 24 88 39	7 24 88 39	7 24 88 39	7 24 88 39	7 24 88 39	7 25 88 39	7 25 88 39	7 25 88 39
1	51.34	27.15	48.00	17.86	00.39	09.65	23.43	05.44	50.74	06.61	11.64	12.98
2	50.91	26.85	48.22	17.54	01.11	09.46	24.32	05.42	51.47	06.74	12.12	13.23
3	50.54	26.53	48.48	17.23	01.81	09.29	25.16	05.40	52.20	06.86	12.64	13.48
4	50.22	26.20	48.78	16.94	02.49	09.12	25.95	05.38	52.96	06.96	13.20	13.74
5	49.96	25.87	49.10	16.66	03.13	08.95	26.72	05.34	53.77	07.06	13.78	14.03
6	49.75	25.55	49.41	16.40	03.73	08.78	27.49	05.29	54.63	07.18	14.34	14.35
7	49.58	25.25	49.71	16.14	04.30	08.60	28.29	05.23	55.53	07.33	14.86	14.68
8	49.44	24.96	49.98	15.88	04.87	08.41	29.14	05.17	56.44	07.51	15.32	15.03
9	49.31	24.68	50.21	15.62	05.45	08.21	30.05	05.12	57.33	07.72	15.71	15.40
10	49.17	24.41	50.42	15.36	06.07	08.00	31.00	05.08	58.17	07.95	16.03	15.76
11	49.00	24.15	50.61	15.09	06.76	07.79	32.00	05.06	58.95	08.18	16.31	16.10
12	48.81	23.89	50.80	14.81	07.52	07.59	33.01	05.06	59.67	08.41	16.56	16.42
13	48.58	23.62	51.02	14.51	08.33	07.40	33.99	05.10	60.34	08.64	16.79	16.72
14	48.32	23.34	51.30	14.19	09.18	07.24	34.94	05.17	60.97	08.86	17.04	17.02
15	48.05	23.05	51.65	13.88	10.04	07.10	35.83	05.25	61.58	09.05	17.33	17.31
16	47.80	22.74	52.07	13.59	10.88	06.99	36.66	05.32	62.21	09.23	17.65	17.60
17	47.61	22.41	52.55	13.31	11.67	06.89	37.46	05.37	62.88	09.41	17.99	17.91
18	47.48	22.06	53.08	13.05	12.43	06.79	38.25	05.41	63.59	09.59	18.34	18.23
19	47.43	21.71	53.61	12.81	13.15	06.68	39.05	05.44	64.32	09.78	18.69	18.57
20	47.45	21.38	54.10	12.59	13.85	06.57	39.88	05.47	65.08	09.99	19.02	18.93
21	47.52	21.08	54.56	12.38	14.55	06.45	40.76	05.50	65.84	10.22	19.30	19.30
22	47.61	20.81	54.98	12.17	15.28	06.32	41.67	05.53	66.60	10.46	19.54	19.68
23	47.68	20.55	55.38	11.95	16.06	06.18	42.62	05.57	67.34	10.72	19.72	20.07
24	47.73	20.29	55.77	11.71	16.89	06.03	43.60	05.63	68.04	10.99	19.84	20.45
25	47.75	20.03	56.18	11.45	17.76	05.89	44.59	05.70	68.69	11.28	19.89	20.82
26	47.73	19.76	56.64	11.18	18.68	05.76	45.57	05.79	69.29	11.58	19.90	21.18
27	47.70	19.48	57.15	10.90	19.63	05.66	46.53	05.91	69.83	11.89	19.88	21.52
28	47.67	19.18	57.71	10.63	20.59	05.58	47.46	06.04	70.31	12.19	19.86	21.85
29	47.67	18.86	58.33	10.36	21.55	05.52	48.35	06.18	70.76	12.46	19.87	22.17
30	47.73	18.53	58.99	10.10	22.50	05.47	49.20	06.32	71.19	12.72	19.91	22.49
31	47.84	18.19	59.68	09.86	23.43	05.44	49.99	06.47	71.64	12.98	19.98	22.81
32	48.00	17.86	60.39	09.65			50.74	06.61			20.08	23.15

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

to G Octantis Mag. 6.74

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₀ ^m ₃₅ ^s ₈₅ ^s ₄₅	—	^h ₁₀ ^m ₃₅ ^s ₈₅ ^s ₄₅	—	^h ₁₀ ^m ₃₅ ^s ₈₅ ^s ₄₅	—	^h ₁₀ ^m ₃₅ ^s ₈₅ ^s ₄₅	—	^h ₁₀ ^m ₃₄ ^s ₈₅ ^s ₄₅	—	^h ₁₀ ^m ₃₄ ^s ₈₅ ^s ₄₅	—
1	06.28	02.03	11.89	12.18	{ ^h ₁₃ ^m ₀₈ { ^h ₂₃ ^m ₁₄ { ^h ₂₃ ^m ₃₆	09.87	35.08	63.69	43.57	55.46	48.18	
2	06.55	02.33	11.97	12.59	12.93	23.96	09.71	35.38	63.48	43.80	55.17	48.28
3	06.80	02.64	12.04	12.99	12.86	24.33	09.57	35.69	63.27	44.05	54.87	48.36
4	07.03	02.98	12.10	13.36	12.79	24.68	09.44	36.02	63.05	44.30	54.56	48.42
5	07.24	03.30	12.16	13.71	12.74	25.03	09.31	36.37	62.81	44.54	54.25	48.46
6	07.43	03.60	12.22	14.04	12.71	25.40	09.17	36.73	62.54	44.78	53.94	48.48
7	07.61	03.88	12.30	14.38	12.69	25.79	09.01	37.10	62.26	45.00	53.64	48.48
8	07.79	04.14	12.41	14.74	12.67	26.19	08.83	37.46	61.97	45.20	53.34	48.47
9	07.98	04.39	12.53	15.12	12.64	26.60	08.63	37.81	61.68	45.38	53.05	48.46
10	08.18	04.65	12.64	15.52	12.60	27.02	08.41	38.14	61.39	45.54	52.78	48.44
11	08.40	04.92	12.74	15.94	12.54	27.45	08.18	38.44	61.10	45.68	52.53	48.42
12	08.63	05.21	12.82	16.37	12.46	27.87	07.95	38.72	60.82	45.81	52.28	48.41
13	08.87	05.52	12.88	16.80	12.36	28.27	07.73	38.99	60.56	45.94	52.04	48.41
14	09.10	05.85	12.92	17.22	12.24	28.66	07.52	39.25	60.31	46.07	51.79	48.42
15	09.32	06.20	12.94	17.63	12.12	29.03	07.31	39.50	60.06	46.21	51.53	48.45
16	09.53	06.56	12.95	18.03	11.99	29.39	07.10	39.75	59.83	46.36	51.26	48.49
17	09.71	06.92	12.95	18.41	11.87	29.73	06.90	40.01	59.59	46.52	50.98	48.51
18	09.87	07.28	12.95	18.78	11.76	30.07	06.72	40.28	59.35	46.69	50.68	48.50
19	10.02	07.63	12.96	19.14	11.65	30.41	06.54	40.56	59.10	46.87	50.37	48.46
20	10.16	07.96	12.97	19.49	11.55	30.75	06.36	40.85	58.83	47.04	50.06	48.41
21	10.29	08.28	12.99	19.85	11.46	31.09	06.17	41.15	58.53	47.20	49.76	48.34
22	10.42	08.59	13.02	20.22	11.37	31.45	05.96	41.45	58.21	47.34	49.47	48.25
23	10.56	08.90	13.06	20.60	11.28	31.82	05.72	41.75	57.89	47.45	49.21	48.15
24	10.71	09.22	13.10	20.99	11.18	32.21	05.46	42.04	57.57	47.54	48.97	48.06
25	10.87	09.54	13.13	21.40	11.07	32.61	05.19	42.31	57.26	47.61	48.74	47.98
26	11.03	09.86	13.15	21.83	10.94	33.01	04.91	42.55	56.97	47.67	48.52	47.92
27	11.20	10.20	13.15	22.27	10.78	33.41	04.64	42.77	56.71	47.73	48.29	47.86
28	11.37	10.57	13.13	22.71	10.60	33.79	04.38	42.97	56.46	47.79	48.05	47.81
29	11.53	10.96	{ ^h ₁₃ ^m ₀₈ { ^h ₂₃ ^m ₁₄ { ^h ₂₃ ^m ₃₆	{ ^h ₂₃ ^m ₁₄ { ^h ₂₃ ^m ₃₆	10.41	34.14	04.13	43.16	56.22	47.87	47.80	47.76
30	11.67	11.36			10.22	34.47	03.90	43.36	55.98	47.96	47.54	47.70
31	11.79	11.77			10.04	34.78	03.69	43.57	55.73	48.07	47.26	47.62
32	11.89	12.18			09.87	35.08			55.46	48.18		

Mean R.A. 10^h 35^m 01^s.68 Mean Dec. -85° 45' 15".75 Sec δ 13.51 Tan δ -13.47

APPARENT PLACES OF STARS, 1935

341

AT UPPER TRANSIT AT GREENWICH

10 G Octantis Mag. 6.74

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s [.] 10 34 85 45	—	^h ^m ^s [.] 10 34 85 45	—	^h ^m ^s [.] 10 34 85 45	—	^h ^m ^s [.] 10 34 85 45	—	^h ^m ^s [.] 10 34 85 45	—	^h ^m ^s [.] 10 34 85 45	—
1	47.26	47.62	40.67	42.12	38.12	33.31	40.40	24.50	47.22	18.39	56.10	17.56
2	46.97	47.52	40.51	41.83	38.15	32.99	40.58	24.26	47.46	18.29	56.37	17.61
3	46.69	47.40	40.36	41.54	38.18	32.69	40.75	24.03	47.70	18.18	56.65	17.65
4	46.42	47.26	40.23	41.26	38.21	32.41	40.92	23.81	47.94	18.06	56.95	17.70
5	46.16	47.10	40.12	40.98	38.24	32.13	41.07	23.59	48.19	17.93	57.28	17.76
6	45.91	46.94	40.02	40.72	38.26	31.86	41.21	23.36	48.46	17.79	57.61	17.84
7	45.67	46.78	39.92	40.48	38.28	31.59	41.35	23.11	48.75	17.66	57.95	17.95
8	45.45	46.62	39.82	40.24	38.29	31.31	41.49	22.85	49.06	17.55	58.29	18.08
9	45.25	46.46	39.72	40.01	38.29	31.01	41.65	22.58	49.39	17.47	58.62	18.24
10	45.05	46.31	39.61	39.78	38.29	30.69	41.83	22.31	49.72	17.41	58.94	18.41
11	44.85	46.17	39.48	39.55	38.30	30.37	42.04	22.04	50.05	17.38	59.24	18.58
12	44.65	46.05	39.34	39.31	38.32	30.04	42.27	21.79	50.37	17.36	59.52	18.75
13	44.44	45.94	39.20	39.05	38.37	29.71	42.51	21.57	50.67	17.35	59.78	18.91
14	44.22	45.82	39.06	38.76	38.46	29.39	42.76	21.38	50.96	17.34	60.03	19.05
15	43.98	45.69	38.93	38.45	38.56	29.08	43.01	21.21	51.24	17.33	60.29	19.18
16	43.73	45.53	38.82	38.13	38.66	28.80	43.25	21.05	51.51	17.30	60.56	19.31
17	43.48	45.35	38.74	37.81	38.77	28.53	43.47	20.89	51.78	17.25	60.84	19.43
18	43.24	45.14	38.68	37.50	38.88	28.27	43.67	20.72	52.06	17.20	61.13	19.56
19	43.00	44.92	38.63	37.21	38.98	28.01	43.87	20.53	52.34	17.15	61.43	19.71
20	42.79	44.70	38.60	36.93	39.07	27.75	44.07	20.33	52.64	17.11	61.74	19.88
21	42.60	44.48	38.58	36.67	39.15	27.48	44.28	20.13	52.96	17.07	62.05	20.07
22	42.44	44.27	38.54	36.42	39.22	27.19	44.50	19.92	53.29	17.04	62.36	20.28
23	42.30	44.06	38.49	36.17	39.29	26.89	44.73	19.70	53.63	17.04	62.66	20.51
24	42.15	43.86	38.43	35.90	39.37	26.57	44.97	19.49	53.97	17.07	62.95	20.75
25	41.99	43.68	38.36	35.61	39.47	26.25	45.23	19.29	54.31	17.12	63.22	21.00
26	41.82	43.51	38.28	35.30	39.59	25.93	45.51	19.11	54.64	17.18	63.47	21.25
27	41.64	43.33	38.21	34.98	39.73	25.62	45.80	18.95	54.96	17.25	63.70	21.50
28	41.44	43.12	38.16	34.65	39.88	25.32	46.10	18.80	55.27	17.33	63.92	21.74
29	41.24	42.89	38.12	34.32	40.04	25.04	46.39	18.67	55.56	17.42	64.14	21.97
30	41.04	42.65	38.10	33.98	40.22	24.76	46.68	18.57	55.83	17.50	64.37	22.18
31	40.85	42.39	38.10	33.64	40.40	24.50	46.96	18.48	56.10	17.56	64.60	22.39
32	40.67	42.12	38.12	33.31			47.22	18.39			64.85	22.60

AT UPPER TRANSIT AT GREENWICH

 η Octantis Mag. 6.26

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s _{10 59 84 14}	—	^h ^m ^s _{10 59 84 14}	—	^h ^m ^s _{10 59 84 14}	—	^h ^m ^s _{10 59 84 14}	—	^h ^m ^s _{10 59 84 15}	—	^h ^m ^s _{10 59 84 15}	—
1	51.56	25.23	56.48	34.78	58.18	45.59	56.72	57.84	52.87	06.97	47.25	12.48
2	51.78	25.50	56.57	35.18	58.16	46.01	56.63	58.15	52.74	07.23	47.06	12.61
3	52.00	25.78	56.64	35.56	58.14	46.41	56.56	58.47	52.60	07.50	46.85	12.72
4	52.20	26.06	56.71	35.92	58.11	46.79	56.49	58.82	52.46	07.78	46.63	12.81
5	52.38	26.34	56.78	36.26	58.08	47.16	56.42	59.20	52.30	08.06	46.41	12.88
6	52.52	26.62	56.86	36.59	58.07	47.52	56.34	59.59	52.13	08.33	46.18	12.93
7	52.68	26.89	56.95	36.93	58.08	47.89	56.25	59.97	51.94	08.58	45.96	12.97
8	52.84	27.14	57.05	37.28	^{38.09} _{38.10}	^{48.27} _{48.67}	56.15	60.34	51.75	08.81	45.75	13.00
9	53.00	27.38	57.16	37.64	58.11	49.08	56.03	60.70	51.55	09.02	45.54	13.02
10	53.17	27.62	57.27	38.02	58.11	49.51	55.90	61.05	51.35	09.21	45.34	13.03
11	53.35	27.87	57.37	38.43	58.10	49.95	55.76	61.38	51.15	09.38	45.15	13.04
12	53.53	28.13	57.47	38.86	58.08	50.38	55.61	61.68	50.96	09.54	44.97	13.07
13	53.73	28.41	57.55	39.29	58.04	50.79	55.46	61.97	50.78	09.70	44.80	13.11
14	53.93	28.72	57.61	39.71	57.98	51.19	55.32	62.25	50.60	09.85	44.63	13.15
15	54.13	29.05	57.66	40.11	57.91	51.57	55.19	62.53	50.43	10.01	44.45	13.19
16	54.31	29.39	57.70	40.50	57.85	51.94	55.06	62.81	50.27	10.19	44.26	13.24
17	54.47	29.73	57.73	40.88	57.79	52.30	54.94	63.09	50.12	10.38	44.05	13.29
18	54.62	30.07	57.76	41.24	57.73	52.65	54.83	63.37	49.96	10.57	43.83	13.33
19	54.75	30.41	57.79	41.60	57.67	52.99	54.72	63.66	49.79	10.77	43.61	13.35
20	54.87	30.74	57.81	41.96	57.62	53.34	54.61	63.97	49.60	10.97	43.39	13.33
21	54.99	31.05	57.85	42.32	57.58	53.70	54.49	64.29	49.39	11.16	43.16	13.28
22	55.11	31.34	57.91	42.68	57.54	54.06	54.36	64.62	49.17	11.34	42.94	13.21
23	55.24	31.63	57.97	43.05	57.50	54.44	54.21	64.95	48.95	11.49	42.73	13.14
24	55.37	31.93	58.03	43.44	57.46	54.83	54.04	65.27	48.73	11.61	42.55	13.08
25	55.51	32.23	58.08	43.85	57.41	55.24	53.86	65.57	48.52	11.71	42.39	13.03
26	55.66	32.54	58.12	44.27	57.35	55.66	53.68	65.84	48.32	11.80	42.23	13.00
27	55.81	32.87	58.16	44.71	57.27	56.07	53.50	66.09	48.12	11.89	42.07	12.98
28	55.96	33.21	58.18	45.15	57.17	56.46	53.32	66.32	47.93	11.98	41.90	12.96
29	56.10	33.58	58.18	45.59	57.06	56.83	53.16	66.53	47.76	12.08	41.71	12.94
30	56.24	33.97			56.94	57.19	53.01	66.74	47.60	12.20	41.51	12.91
31	56.37	34.37			56.82	57.52	52.87	66.97	47.43	12.34	41.31	12.87
32	56.48	34.78			56.72	57.84			47.25	12.48		

Mean R.A. 10^h 59^m 48^s.93 Mean Dec. -84° 14' 39".20 Sec δ 9.97 Tan δ -9.92

APPARENT PLACES OF STARS, 1935

343

AT UPPER TRANSIT AT GREENWICH

 η Octantis Mag. 6.26

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s _{10 59 84 15}	—	^h ^m ^s _{10 59 84 14}	—	^h ^m ^s _{10 59 84 14}	—	^h ^m ^s _{10 59 84 14}	—	^h ^m ^s _{10 59 84 14}	—	^h ^m ^s _{10 59 84 14}	—
1	41.31	12.87	36.18	68.11	33.73	59.65	34.83	50.65	39.44	43.84	45.96	42.10
2	41.10	12.80	36.04	67.85	33.73	59.34	34.95	50.39	39.61	43.73	46.16	42.13
3	40.89	12.70	35.92	67.59	33.74	59.04	35.06	50.14	39.78	43.60	46.37	42.14
4	40.68	12.58	35.81	67.33	33.75	58.75	35.17	49.91	39.95	43.46	46.60	42.15
5	40.47	12.45	35.71	67.07	33.76	58.46	35.27	49.68	40.13	43.30	46.84	42.17
6	40.27	12.32	35.62	66.82	33.76	58.18	35.36	49.44	40.32	43.13	47.10	42.22
7	40.09	12.18	35.53	66.58	33.75	57.91	35.45	49.18	40.52	42.97	47.36	42.29
8	39.93	12.04	35.44	66.35	33.74	57.64	35.54	48.89	40.74	42.83	47.62	42.39
9	39.77	11.90	35.35	66.13	33.72	57.36	35.64	48.60	40.97	42.71	47.87	42.52
10	39.62	11.77	35.25	65.91	33.70	57.06	35.75	48.31	41.21	42.61	48.11	42.66
11	39.47	11.67	35.14	65.69	33.69	56.73	35.88	48.04	41.46	42.54	48.34	42.80
12	39.32	11.58	35.03	65.47	33.68	56.39	36.03	47.78	41.70	42.50	48.56	42.93
13	39.16	11.49	34.92	65.23	33.69	56.05	36.19	47.53	41.92	42.48	48.77	43.05
14	38.99	11.39	34.80	64.96	33.72	55.72	36.36	47.30	42.13	42.44	48.97	43.16
15	38.81	11.28	34.68	64.66	33.77	55.41	36.53	47.10	42.34	42.39	49.17	43.27
16	38.62	11.15	34.57	64.35	33.84	55.11	36.69	46.91	42.54	42.32	49.38	43.37
17	38.43	11.00	34.48	64.05	33.91	54.83	36.84	46.72	42.74	42.25	49.60	43.47
18	38.23	10.82	34.42	63.76	33.97	54.56	36.98	46.53	42.94	42.18	49.82	43.58
19	38.04	10.62	34.38	63.48	34.02	54.30	37.11	46.33	43.15	42.11	50.05	43.70
20	37.87	10.41	34.35	63.21	34.07	54.03	37.24	46.12	43.37	42.03	50.29	43.83
21	37.73	10.21	34.31	62.95	34.11	53.75	37.38	45.89	43.60	41.96	50.54	43.98
22	37.61	10.01	34.26	62.70	34.15	53.46	37.53	45.65	43.84	41.90	50.78	44.15
23	37.49	09.83	34.20	62.45	34.19	53.15	37.69	45.41	44.08	41.86	51.02	44.35
24	37.37	09.66	34.14	62.19	34.23	52.83	37.86	45.18	44.33	41.85	51.25	44.57
25	37.24	09.51	34.07	61.91	34.28	52.50	38.04	44.96	44.58	41.86	51.47	44.79
26	37.10	09.36	34.00	61.62	34.34	52.17	38.23	44.75	44.84	41.89	51.68	45.01
27	36.96	09.20	33.93	61.31	34.41	51.84	38.43	44.55	45.09	41.92	51.87	45.24
28	36.81	09.02	33.87	60.98	34.50	51.52	38.64	44.37	45.32	41.96	52.05	45.46
29	36.65	08.83	33.82	60.64	34.60	51.22	38.85	44.21	45.54	42.01	52.23	45.66
30	36.49	08.61	33.78	60.30	34.71	50.93	39.05	44.07	45.75	42.06	52.41	45.85
31	36.33	08.37	33.75	59.97	34.83	50.65	39.25	43.95	45.96	42.10	52.60	46.03
32	36.18	08.11	33.73	59.65			39.44	43.84			52.80	46.22

AT UPPER TRANSIT AT GREENWICH

δ Octantis Mag. 4.14

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}
	14 16 83 22		14 16 83 22		14 16 83 22		14 16 83 22		14 16 83 22		14 16 83 22	
1	11.81	10.29	18.76	11.60	24.45	17.16	28.98	26.72	31.03	37.50	30.52	47.60
2	12.06	10.24	18.98	11.78	24.63	17.47	29.06	27.05	31.07	37.81	30.49	47.92
3	12.30	10.22	19.19	11.96	24.79	17.77	29.14	27.35	31.12	38.14	30.43	48.24
4	12.54	10.22	19.39	12.13	24.94	18.05	29.24	27.65	31.17	38.50	30.35	48.56
5	12.77	10.24	19.58	12.29	25.09	18.32	29.36	27.95	31.21	38.87	30.26	48.87
6	12.99	10.26	19.77	12.43	25.24	18.57	29.49	28.28	31.24	39.26	30.16	49.16
7	13.19	10.27	19.97	12.56	25.40	18.80	29.61	28.62	31.25	39.65	30.06	49.43
8	13.38	10.28	20.18	12.68	25.57	19.04	29.73	28.98	31.25	40.03	29.95	49.68
9	13.57	10.28	20.40	12.81	25.76	19.30	29.84	29.36	31.24	40.40	29.85	49.92
10	13.77	10.26	20.63	12.96	25.96	19.58	29.94	29.74	31.21	40.76	29.75	50.15
11	13.98	10.23	20.86	13.12	26.15	19.87	30.02	30.13	31.18	41.09	29.66	50.37
12	14.20	10.20	21.10	13.30	26.33	20.17	30.09	30.51	31.15	41.40	29.58	50.59
13	14.43	10.18	21.33	13.51	26.50	20.49	30.15	30.88	31.12	41.70	29.51	50.82
14	14.68	10.18	21.55	13.74	26.66	20.82	30.20	31.24	31.10	41.99	29.44	51.06
15	14.94	10.20	21.76	13.97	26.81	21.15	30.25	31.58	31.08	42.28	29.37	51.30
16	15.19	10.25	21.95	14.20	26.94	21.48	30.30	31.91	31.07	42.58	29.30	51.55
17	15.43	10.31	22.13	14.42	27.07	21.80	30.35	32.23	31.07	42.89	29.22	51.82
18	15.66	10.38	22.31	14.64	27.19	22.10	30.41	32.55	31.08	43.22	29.12	52.10
19	15.88	10.47	22.48	14.85	27.31	22.40	30.47	32.86	31.09	43.56	29.00	52.37
20	16.09	10.55	22.65	15.05	27.43	22.69	30.54	33.18	31.08	43.91	28.87	52.63
21	16.29	10.63	22.83	15.24	27.56	22.97	30.62	33.51	31.06	44.27	28.73	52.86
22	16.49	10.70	23.02	15.42	27.69	23.25	30.71	33.86	31.02	44.63	28.60	53.06
23	16.69	10.76	23.21	15.61	27.83	23.54	30.79	34.24	30.97	44.98	28.47	53.23
24	16.89	10.82	23.41	15.81	27.98	23.84	30.85	34.65	30.90	45.31	28.35	53.39
25	17.09	10.87	23.62	16.03	28.14	24.16	30.90	35.06	30.83	45.61	28.24	53.55
26	17.30	10.92	23.84	16.27	28.29	24.50	30.94	35.46	30.77	45.89	28.14	53.71
27	17.53	10.99	24.06	16.55	28.43	24.86	$\left\{ \begin{smallmatrix} 30.96 \\ 30.97 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 35.84 \\ 36.20 \end{smallmatrix} \right\}$	30.71	46.16	28.05	53.89
28	17.77	11.07	24.26	16.85	28.56	25.24	30.97	36.55	30.66	46.43	27.96	54.09
29	18.02	11.16	24.45	17.16	28.68	25.62	30.98	36.88	30.61	46.70	27.85	54.30
30	18.27	11.28			28.79	26.00	31.00	37.19	30.57	46.98	27.73	54.51
31	18.52	11.43			28.89	26.37	31.03	37.50	30.54	47.28	27.60	54.72
32	18.76	11.60			28.98	26.72			30.52	47.60		

Mean R.A. 14^h 16^m 16^s.11 Mean Dec. -83° 22' 21".27 Sec δ 8.66 Tan δ -8.61

AT UPPER TRANSIT AT GREENWICH

δ Octantis Mag. 4.14

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s _{14 16 83 22}	—	^h ^m ^s _{14 16 83 22}	—	^h ^m ^s _{14 16 83 22}	—	^h ^m ^s _{14 16 83 22}	—	^h ^m ^s _{14 16 83 22}	—	^h ^m ^s _{14 16 83 22}	—
1	27.60	54.72	22.90	57.57	17.98	54.94	14.76	47.99	14.41	38.67	17.33	30.67
2	27.46	54.92	22.71	57.55	17.84	54.72	14.72	47.70	14.46	38.41	17.45	30.47
3	27.31	55.11	22.53	57.51	17.71	54.51	14.68	47.43	14.50	38.15	17.57	30.25
4	27.15	55.28	22.35	57.46	17.59	54.32	14.64	47.17	14.53	37.87	17.70	30.02
5	26.99	55.42	22.18	57.41	17.49	54.15	14.59	46.92	14.56	37.58	17.84	29.79
6	26.83	55.54	22.03	57.36	17.38	53.99	14.53	46.67	14.59	37.27	18.00	29.56
7	26.68	55.65	21.89	57.31	17.27	53.83	14.47	46.42	14.64	36.94	18.18	29.33
8	26.53	55.75	21.75	57.27	17.15	53.67	14.40	46.15	14.71	36.60	18.38	29.11
9	26.39	55.84	21.61	57.24	17.02	53.51	14.33	45.85	14.79	36.27	18.58	28.92
10	26.26	55.93	21.47	57.22	16.88	53.34	14.27	45.53	14.88	35.96	18.78	28.76
11	26.14	56.03	21.33	57.21	16.73	53.15	14.22	45.20	14.99	35.67	18.98	28.63
12	26.02	56.15	21.17	57.20	16.58	52.93	14.19	44.86	15.11	35.40	19.17	28.51
13	25.90	56.28	21.00	57.18	16.44	52.69	14.18	44.52	15.22	35.14	19.34	28.38
14	25.77	56.43	20.82	57.14	16.31	52.43	14.18	44.19	15.32	34.90	19.50	28.24
15	25.63	56.58	20.63	57.08	16.21	52.16	14.19	43.88	15.41	34.66	19.65	28.09
16	25.48	56.73	20.44	56.99	16.12	51.91	14.20	43.59	15.50	34.42	19.81	27.94
17	25.31	56.86	20.26	56.88	16.04	51.67	14.21	43.31	15.58	34.16	19.98	27.78
18	25.13	56.97	20.10	56.75	15.96	51.44	14.21	43.04	15.65	33.89	20.15	27.61
19	24.95	57.04	19.96	56.62	15.88	51.22	14.20	42.78	15.73	33.61	20.33	27.43
20	24.77	57.09	19.83	56.50	15.79	51.00	14.18	42.51	15.82	33.33	20.52	27.26
21	24.60	57.12	19.70	56.39	15.69	50.78	14.16	42.21	15.92	33.04	20.72	27.10
22	24.45	57.14	19.57	56.29	15.59	50.56	14.13	41.89	16.03	32.74	20.93	26.96
23	24.31	57.17	19.44	56.20	15.48	50.33	14.11	41.55	16.16	32.44	21.15	26.85
24	24.18	57.21	19.30	56.11	15.37	50.07	14.10	41.21	16.30	32.16	21.38	26.76
25	24.05	57.25	19.15	56.02	15.25	49.79	14.10	40.87	16.45	31.90	21.61	26.69
26	23.92	57.30	18.98	55.92	15.14	49.50	14.12	40.53	16.60	31.65	21.83	26.63
27	23.78	57.36	18.80	55.80	15.04	49.21	14.15	40.19	16.75	31.42	22.04	26.58
28	23.62	57.42	18.63	55.66	14.95	48.91	14.19	39.86	16.91	31.22	22.23	26.54
29	23.45	57.48	18.46	55.51	14.87	48.60	14.24	39.54	17.06	31.04	22.41	26.49
30	23.27	57.53	18.29	55.34	14.81	48.29	14.29	39.23	17.20	30.86	22.59	26.42
31	23.09	57.56	18.13	55.15	14.76	47.99	14.35	38.94	17.33	30.67	22.78	26.34
32	22.90	57.57	17.98	54.94			14.41	38.67			22.98	26.25

AT UPPER TRANSIT AT GREENWICH

 ρ Octantis Mag. 5.66

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 15 27 84 15	—	^h ^m 15 28 84 15	—	^h ^m 15 28 84 15	—	^h ^m 15 28 84 15	—	^h ^m 15 28 84 15	—	^h ^m 15 28 84 15	—
1	52.98	05.25	00.75	02.98	08.06	05.35	14.98	12.15	19.40	21.17	21.09	31.52
2	53.23	05.09	01.03	03.04	08.32	05.55	15.14	12.41	19.50	21.45	21.11	31.86
3	53.49	04.96	01.29	03.11	08.56	05.75	15.30	12.65	19.61	21.73	21.11	32.21
4	53.75	04.85	01.54	03.18	08.79	05.94	15.47	12.89	19.73	22.03	21.10	32.56
5	54.00	04.76	01.77	03.23	09.01	06.12	15.66	13.13	19.86	22.35	21.07	32.90
6	54.24	04.68	02.01	03.26	09.22	06.28	15.87	13.38	19.99	22.70	21.03	33.23
7	54.46	04.60	02.25	03.27	09.44	06.43	16.08	13.65	20.10	23.06	20.97	33.55
8	54.67	04.50	02.50	03.28	09.68	06.57	16.29	13.93	20.19	23.43	20.91	33.85
9	54.87	04.39	02.77	03.29	09.94	06.71	16.49	14.24	20.27	23.79	20.85	34.13
10	55.08	04.26	03.05	03.31	10.20	06.87	16.67	14.56	20.33	24.15	20.79	34.40
11	55.30	04.12	03.34	03.34	10.47	07.05	16.84	14.89	20.37	24.50	20.74	34.66
12	55.53	03.97	03.64	03.39	10.74	07.25	17.00	15.22	20.41	24.84	20.70	34.92
13	55.78	03.83	03.93	03.48	11.00	07.48	17.14	15.54	20.45	25.16	20.67	35.18
14	56.05	03.70	04.21	03.59	11.24	07.72	17.27	15.85	20.48	25.46	20.65	35.45
15	56.33	03.59	04.48	03.71	11.47	07.96	17.39	16.15	{20.32}	{23.76}	20.63	35.73
16	56.61	03.51	04.74	03.83	11.68	08.20	17.51	16.44	20.63	26.34	20.60	36.04
17	56.88	03.46	04.99	03.95	11.88	08.44	17.64	16.73	20.69	26.64	20.56	36.36
18	57.14	03.42	05.23	04.06	12.08	08.68	17.77	17.01	20.76	26.96	20.51	36.68
19	57.40	03.40	05.46	04.17	12.27	08.91	17.91	17.27	20.83	27.30	20.44	37.00
20	57.65	03.38	05.68	04.27	12.46	09.11	18.06	17.53	20.90	27.66	20.36	37.31
21	57.88	03.36	05.91	04.36	12.65	09.31	18.22	17.81	20.96	28.03	20.26	37.60
22	58.11	03.33	06.15	04.45	12.85	09.50	18.39	18.12	21.00	28.40	20.16	37.87
23	58.34	03.28	06.40	04.53	13.07	09.70	18.55	18.46	21.02	28.76	20.05	38.11
24	58.56	03.22	06.67	04.61	13.30	09.91	18.70	18.82	21.02	29.12	19.95	38.33
25	58.79	03.15	06.95	04.70	13.54	10.13	18.84	19.18	21.00	29.46	19.87	38.54
26	59.04	03.08	07.23	04.82	13.78	10.37	18.96	19.54	20.98	29.77	19.80	38.76
27	59.30	03.02	07.51	04.97	14.01	10.64	19.07	19.90	20.97	30.05	19.74	39.00
28	59.57	02.97	07.79	05.15	14.24	10.93	19.16	20.25	20.98	30.33	19.68	39.26
29	59.86	02.93	08.06	05.35	14.45	11.24	19.24	20.58	21.00	30.61	19.61	39.53
30	60.16	02.92			14.64	11.56	19.32	20.88	21.03	30.90	19.53	39.81
31	60.46	02.94			14.82	11.87	19.40	21.17	21.06	31.20	19.44	40.08
32	60.75	02.98			14.98	12.15			21.09	31.52		

Mean R.A. 15^h 28^m 00^s.08 Mean Dec. -84° 15' 13".03 Sec 8 9.99 Tan δ -9.94

AT UPPER TRANSIT AT GREENWICH

 ρ Octantis Mag. 5.66

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 15 ^m 28 ^s 84 [°] 15'	—	^h 15 ^m 28 ^s 84 [°] 15'	—	^h 15 ^m 28 ^s 84 [°] 15'	—	^h 15 ^m 28 ^s 84 [°] 15'	—	^h 15 ^m 28 ^s 84 [°] 15'	—	^h 15 ^m 28 ^s 84 [°] 15'	—
1	19.44	40.08	14.92	45.46	09.03	45.64	04.07	40.85	01.72	32.22	03.17	23.17
2	19.33	40.35	14.72	45.55	08.84	45.52	03.97	40.60	01.71	31.96	03.26	22.92
3	19.20	40.61	14.52	45.61	08.66	45.40	03.87	40.36	01.70	31.70	03.35	22.65
4	19.06	40.86	14.32	45.66	08.49	45.29	03.77	40.14	01.68	31.43	03.44	22.36
5	18.91	41.09	14.12	45.69	08.33	45.19	03.67	39.94	01.65	31.14	03.55	22.05
6	18.76	41.30	13.94	45.72	08.18	45.10	03.56	39.74	01.62	30.82	03.68	21.73
7	18.62	41.48	13.77	45.76	08.03	45.02	03.43	39.53	01.60	30.48	03.82	21.42
8	18.48	41.65	13.61	45.80	07.87	44.94	03.29	39.30	01.60	30.13	03.99	21.13
9	18.35	41.82	13.46	45.85	07.69	44.86	03.15	39.05	01.62	29.77	04.17	20.86
10	18.23	41.99	13.31	45.91	07.49	44.78	03.02	38.79	01.65	29.42	04.35	20.61
11	18.12	42.17	13.15	45.99	07.28	44.68	02.90	38.50	01.70	29.09	04.52	20.38
12	18.02	42.36	12.97	46.08	07.07	44.56	02.79	38.19	01.77	28.78	04.69	20.17
13	17.92	42.56	12.77	46.16	06.87	44.40	02.70	37.87	01.84	28.48	04.85	19.96
14	17.81	42.78	12.56	46.22	06.69	44.21	02.64	37.56	01.90	28.20	05.00	19.75
15	17.69	43.00	12.35	46.26	06.52	44.01	02.59	37.26	01.95	27.93	05.13	19.53
16	17.55	43.22	12.14	46.27	06.37	43.82	02.54	36.99	01.99	27.66	05.26	19.30
17	17.39	43.43	11.93	46.26	06.23	43.64	02.48	36.74	02.02	27.38	05.40	19.06
18	17.22	43.62	11.73	46.23	06.10	43.47	02.42	36.49	02.05	27.09	05.55	18.81
19	17.04	43.78	11.55	46.18	05.97	43.31	02.35	36.24	02.08	26.78	05.72	18.55
20	16.86	43.92	11.38	46.13	05.83	43.16	02.27	35.98	02.11	26.46	05.90	18.28
21	16.68	44.04	11.21	46.10	05.68	43.02	02.18	35.71	02.15	26.13	06.09	18.02
22	16.51	44.15	11.05	46.09	05.52	42.87	02.09	35.43	02.21	25.79	06.29	17.79
23	16.37	44.26	10.89	46.08	05.35	42.71	02.00	35.13	02.29	25.45	06.50	17.57
24	16.24	44.37	10.72	46.08	05.17	42.53	01.92	34.81	02.38	25.11	06.72	17.37
25	16.11	44.49	10.53	46.08	04.98	42.33	01.85	34.47	02.48	24.78	06.94	17.19
26	15.98	44.63	10.32	46.07	04.80	42.11	01.79	34.13	02.60	24.47	07.16	17.03
27	15.84	44.78	10.10	46.04	04.63	41.87	01.75	33.79	02.72	24.18	07.38	16.88
28	15.68	44.93	09.88	46.00	04.47	41.62	01.73	33.45	02.84	23.91	07.59	16.75
29	15.51	45.08	09.66	45.94	04.32	41.37	01.72	33.12	02.96	23.65	07.78	16.61
30	15.32	45.22	09.44	45.86	04.19	41.11	01.72	32.80	03.07	23.41	07.96	16.45
31	15.12	45.35	09.23	45.76	04.07	40.85	01.72	32.50	03.17	23.17	08.14	16.27
32	14.92	45.46	09.03	45.64			01.72	32.22			08.33	16.08

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

44 G Octantis Mag. 6.32

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₉ ^m ₄₄ ^s ₈₁ ^m ₃₀	—	^h ₁₉ ^m ₄₄ ^s ₈₁ ^m ₃₀	—	^h ₁₉ ^m ₄₄ ^s ₈₁ ^m ₃₀	—	^h ₁₉ ^m ₄₄ ^s ₈₁ ^m ₃₀	—	^h ₁₉ ^m ₄₄ ^s ₈₁ ^m ₃₀	—	^h ₁₉ ^m ₄₄ ^s ₈₁ ^m ₃₀	—
1	05.00	68.97	06.48	58.47	09.69	50.29	14.63	44.36	19.84	42.47	24.77	44.67
2	05.02	68.60	06.59	58.16	09.85	50.06	14.79	44.25	20.00	42.44	24.93	44.79
3	05.05	68.24	06.70	57.88	10.01	49.84	14.94	44.13	20.16	42.41	25.09	44.92
4	05.09	67.89	06.80	57.62	10.15	49.63	15.09	43.99	20.33	42.38	25.25	45.08
5	05.13	67.56	06.89	57.35	10.28	49.42	15.25	43.84	20.51	42.36	25.40	45.26
6	05.17	67.25	06.97	57.07	10.41	49.20	15.42	43.69	20.70	42.37	25.54	45.45
7	05.20	66.95	07.04	56.76	10.54	48.97	15.61	43.53	20.90	42.40	25.67	45.65
8	05.22	66.66	07.12	56.43	10.67	48.72	15.80	43.39	21.09	42.45	25.79	45.85
9	05.23	66.35	07.20	56.08	10.81	48.46	15.99	43.27	21.27	42.51	25.91	46.06
10	05.24	66.03	07.30	55.73	10.96	48.18	16.19	43.18	21.44	42.59	26.02	46.26
11	05.25	65.69	07.41	55.37	11.12	47.92	16.38	43.12	21.60	42.68	26.12	46.45
12	05.26	65.33	07.52	55.03	11.29	47.68	16.57	43.07	21.76	42.77	26.22	46.63
13	05.28	64.96	07.65	54.70	11.47	47.46	16.75	43.03	21.91	42.85	26.32	46.79
14	05.31	64.57	07.79	54.40	11.65	47.26	16.92	42.99	22.05	42.93	26.43	46.94
15	05.36	64.19	07.92	54.13	11.82	47.08	17.08	42.95	22.19	43.00	26.55	47.09
16	05.42	63.82	08.05	53.87	11.99	46.91	17.24	42.91	22.33	43.05	26.68	47.25
17	05.48	63.47	08.17	53.61	12.15	46.75	17.39	42.86	22.48	43.09	26.82	47.43
18	05.55	63.14	08.29	53.36	12.30	46.60	17.54	42.79	22.64	43.13	26.96	47.63
19	05.62	62.83	08.40	53.11	12.44	46.44	17.70	42.71	22.80	43.17	27.09	47.85
20	05.68	62.53	08.50	52.85	12.58	46.27	17.86	42.63	22.97	43.22	27.22	48.09
21	05.74	62.23	08.60	52.58	12.72	46.09	18.04	42.55	23.15	43.30	27.33	48.34
22	05.79	61.92	08.70	52.30	12.86	45.90	18.23	42.47	23.34	43.41	27.42	48.60
23	05.84	61.61	08.81	52.01	13.01	45.70	18.42	42.41	23.52	43.55	27.50	48.86
24	05.88	61.30	08.93	51.71	13.17	45.50	18.62	42.37	23.68	43.70	27.58	49.10
25	05.92	60.97	09.06	51.40	13.34	45.30	18.82	42.35	23.83	43.85	27.65	49.31
26	05.97	60.63	09.20	51.09	13.52	45.11	19.02	42.37	23.97	44.00	27.73	49.50
27	06.02	60.28	09.36	50.80	13.71	44.93	19.21	42.40	24.10	44.15	27.81	49.68
28	06.08	59.91	09.52	50.54	13.91	44.78	19.38	42.43	24.22	44.28	27.90	49.87
29	06.16	59.54	09.69	50.29	14.11	44.65	19.54	42.46	24.35	44.38	28.00	50.06
30	06.26	59.16			14.30	44.55	19.69	42.48	24.48	44.48	28.11	50.26
31	06.37	58.80			14.47	44.46	19.84	42.47	24.62	44.57	28.22	50.49
32	06.48	58.47			14.63	44.36			24.77	44.67		

Mean R.A. 19^h 44^m 09^s.76 Mean Dec. -81° 31' 01".59 Sec δ 6.78 Tan δ -6.70

AT UPPER TRANSIT AT GREENWICH

44 G Octantis Mag. 6.32

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s 19 44 81 30	—	^h ^m ^s 19 44 81 30	—	^h ^m ^s 19 44 81 31	—	^h ^m ^s 19 44 81 31	—	^h ^m ^s 19 44 81 31	—	^h ^m ^s 19 44 81 30	—
1	28.22	50.49	29.52	59.18	28.09	07.12	24.79	11.81	20.68	11.67	17.47	66.53
2	28.31	50.75	29.50	59.48	27.99	07.32	24.67	11.86	20.58	11.58	17.39	66.31
3	28.40	51.03	29.47	59.76	27.90	07.51	24.55	11.91	20.47	11.52	17.30	66.09
4	28.48	51.32	29.43	60.03	27.81	07.69	24.44	11.97	20.35	11.45	17.21	65.85
5	28.55	51.61	29.40	60.30	27.73	07.86	24.33	12.04	20.21	11.37	17.11	65.59
6	28.61	51.90	29.37	60.55	27.67	08.04	24.22	12.12	20.07	11.27	17.02	65.30
7	28.65	52.17	29.35	60.79	27.60	08.24	24.10	12.21	19.93	11.16	16.94	64.99
8	28.69	52.43	29.33	61.01	27.52	08.45	23.97	12.31	19.78	11.03	16.88	64.67
9	28.73	52.69	29.32	61.25	27.44	08.66	23.83	12.40	19.64	10.87	16.83	64.36
10	28.77	52.94	29.31	61.51	27.35	08.88	23.68	12.47	19.52	10.69	16.79	64.05
11	28.82	53.17	29.31	61.78	27.25	09.11	23.52	12.51	19.41	10.49	16.76	63.76
12	28.87	53.40	29.31	62.07	27.14	09.32	23.36	12.52	19.31	10.29	16.73	63.48
13	28.93	53.63	29.29	62.38	27.01	09.51	23.21	12.50	19.21	10.11	16.69	63.21
14	29.00	53.87	29.26	62.68	26.88	09.67	23.07	12.47	19.12	09.94	16.65	62.96
15	29.08	54.12	29.22	62.97	26.76	09.82	22.95	12.44	19.03	09.79	16.60	62.70
16	29.15	54.39	29.16	63.25	26.64	09.96	22.83	12.41	18.93	09.65	16.54	62.44
17	29.21	54.68	29.09	63.52	26.53	10.08	22.72	12.39	18.82	09.51	16.48	62.17
18	29.27	54.98	29.02	63.77	26.43	10.19	22.60	12.39	18.70	09.36	16.42	61.88
19	{29.31 29.33}	{55.29 55.60}	28.96	64.00	26.33	10.31	22.48	12.40	18.58	09.21	16.36	61.57
20	29.34	55.89	28.90	64.20	26.24	10.45	22.35	12.41	18.46	09.04	16.31	61.25
21	29.34	56.16	28.85	64.40	26.14	10.60	22.21	12.42	18.34	08.85	16.27	60.91
22	29.34	56.42	28.81	64.62	26.03	10.76	22.07	12.43	18.22	08.64	16.24	60.56
23	29.35	56.65	28.77	64.85	25.92	10.94	21.92	12.42	18.10	08.41	16.21	60.21
24	29.37	56.87	28.73	65.10	25.80	11.11	21.76	12.40	17.99	08.16	16.20	59.86
25	29.40	57.11	28.69	65.36	25.66	11.26	21.60	12.36	17.89	07.91	16.20	59.52
26	29.43	57.36	28.63	65.63	25.52	11.39	21.44	12.29	17.81	07.65	16.21	59.20
27	29.47	57.63	28.56	65.90	25.37	11.51	21.29	12.20	17.74	07.41	16.22	58.90
28	29.50	57.91	28.48	66.17	25.22	11.61	21.15	12.10	17.67	07.18	16.23	58.61
29	29.52	58.22	28.39	66.44	25.07	11.69	21.02	11.99	17.61	06.96	16.22	58.32
30	29.53	58.54	28.30	66.69	24.92	11.76	20.90	11.88	17.54	06.74	16.21	58.02
31	29.53	58.86	28.20	66.91	24.79	11.81	20.79	11.77	17.47	06.53	16.19	57.71
32	29.52	59.18	28.09	67.12			20.68	11.67			16.17	57.39

AT UPPER TRANSIT AT GREENWICH

 σ Octantis Mag. 5.48

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s ₁₀	^h ^m ^s ₁₀	^h ^m ^s ₁₀	^h ^m ^s ₁₀	^h ^m ^s ₁₀	^h ^m ^s ₁₀	^h ^m ^s ₁₀	^h ^m ^s ₁₀	^h ^m ^s ₁₀	^h ^m ^s ₁₀	^h ^m ^s ₁₀	^h ^m ^s ₁₀
1	49.73	62.18	59.53	50.96	28.80	42.08	16.54	35.58	07.65	33.36	56.21	35.52
2	49.65	61.79	60.51	50.62	30.35	41.83	18.09	35.46	09.19	33.33	57.72	35.63
3	49.70	61.40	61.47	50.31	31.83	41.59	19.60	35.32	10.77	33.30	59.27	35.77
4	49.85	61.01	62.35	50.01	33.23	41.36	21.10	35.17	12.46	33.27	60.81	35.94
5	50.06	60.66	63.15	49.70	34.53	41.13	22.65	35.00	14.22	33.25	62.30	36.13
6	50.28	60.33	63.87	49.38	35.77	40.90	24.29	34.83	16.05	33.26	63.72	36.33
7	50.46	60.01	64.54	49.05	36.98	40.65	26.03	34.67	17.90	33.28	65.05	36.54
8	50.55	59.69	65.21	48.71	38.22	40.38	27.85	34.52	19.74	33.31	66.29	36.76
9	50.56	59.37	65.94	48.36	39.54	40.08	29.73	34.39	21.53	33.37	67.45	36.97
10	50.51	59.03	66.78	47.99	40.96	39.79	31.62	34.28	23.25	33.45	68.53	37.17
11	50.43	58.67	67.72	47.61	42.48	39.51	33.50	34.20	24.90	33.54	69.58	37.35
12	50.38	58.29	68.77	47.24	44.08	39.25	35.34	34.14	26.46	33.62	70.60	37.53
13	50.43	57.90	69.91	46.89	45.74	39.02	37.11	34.09	27.96	33.70	71.64	37.70
14	50.58	57.50	71.09	46.56	47.42	38.80	38.81	34.04	29.40	33.78	72.72	37.86
15	50.86	57.09	72.29	46.24	49.07	38.59	40.44	33.99	30.81	33.85	73.87	38.01
16	51.23	56.69	73.47	45.95	50.69	38.40	42.01	33.94	32.23	33.90	75.09	38.17
17	51.69	56.32	74.61	45.67	52.25	38.22	43.57	33.87	33.68	33.94	76.38	38.35
18	52.19	55.96	75.71	45.40	53.75	38.05	45.11	33.78	35.19	33.99	77.71	38.56
19	52.70	55.61	76.75	45.13	55.20	37.88	46.68	33.70	36.79	34.04	79.01	38.79
20	53.18	55.28	77.76	44.85	56.61	37.69	48.29	33.62	38.47	34.09	80.25	39.04
21	53.63	54.95	78.74	44.56	58.00	37.49	49.99	33.54	40.20	34.16	81.38	39.30
22	54.05	54.62	79.72	44.26	59.41	37.29	51.78	33.45	41.97	34.27	82.38	39.57
23	54.41	54.29	80.74	43.96	60.85	37.08	53.66	33.38	43.70	34.40	83.25	39.85
24	54.75	53.96	81.82	43.64	62.37	36.86	55.60	33.33	45.35	34.54	84.03	40.10
25	55.08	53.62	83.00	43.30	64.00	36.64	57.55	33.30	46.89	34.69	84.76	40.32
26	55.43	53.25	84.31	42.96	65.73	36.42	59.46	33.30	48.31	34.84	85.52	40.52
27	55.84	52.86	85.73	42.64	67.55	36.21	61.29	33.32	49.62	34.99	86.33	40.72
28	56.34	52.47	87.24	42.35	69.43	36.03	63.01	33.35	50.88	35.13	87.22	40.92
29	56.96	52.08	88.80	42.08	71.32	35.89	64.62	33.37	52.13	35.24	88.17	41.13
30	57.71	51.70			73.15	35.78	66.15	33.38	53.41	35.33	89.16	41.35
31	58.58	51.32			74.90	35.68	67.65	33.36	54.77	35.42	90.16	41.60
32	59.53	50.96			76.54	35.58			56.21	35.52		

Mean R.A. 19^h 54^m 45^s.37 Mean Dec. -89° 10' 54".39 Sec δ 70.03 Tan δ -70.02

AT UPPER TRANSIT AT GREENWICH

 σ Octantis Mag. 5.48

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s 19 57 89 10	—	^h ^m ^s 19 57 89 10	—	^h ^m ^s 19 56 89 10	—	^h ^m ^s 19 56 89 11	—	^h ^m ^s 19 55 89 10	—	^h ^m ^s 19 55 89 10	—
1	30.16	41.60	43.10	50.76	88.61	59.32	54.07	04.54	69.32	64.71	32.16	59.44
2	31.12	41.87	42.93	51.08	87.59	59.54	52.69	04.61	68.08	64.63	31.21	59.23
3	32.01	42.16	42.68	51.38	86.59	59.75	51.40	04.67	66.82	64.56	30.17	59.01
4	32.81	42.45	42.39	51.67	85.65	59.95	50.18	04.74	65.49	64.49	29.08	58.76
5	33.51	42.74	42.07	51.95	84.78	60.14	48.97	04.82	64.06	64.42	27.97	58.49
6	34.11	43.03	41.77	52.22	83.97	60.34	47.75	04.91	62.54	64.34	26.90	58.20
7	34.64	43.33	41.50	52.48	83.21	60.55	46.47	05.01	60.96	64.23	25.91	57.88
8	35.10	43.62	41.29	52.73	82.44	60.77	45.09	05.12	59.38	64.09	25.05	57.54
9	35.52	43.88	41.15	52.97	81.63	61.01	43.59	05.23	57.85	63.92	24.31	57.20
10	35.94	44.13	41.06	53.24	80.72	61.25	42.01	05.31	56.40	63.73	23.68	56.88
11	36.39	44.38	41.00	53.54	79.69	61.50	40.36	05.36	55.07	63.53	23.11	56.57
12	36.88	44.63	40.90	53.84	78.53	61.74	38.72	05.37	53.84	63.33	22.57	56.28
13	37.45	44.87	40.73	54.16	77.28	61.95	37.12	05.36	52.70	63.14	22.02	55.99
14	38.08	45.12	40.44	54.49	75.98	62.13	35.61	05.34	51.59	62.97	21.42	55.71
15	38.75	45.38	40.02	54.81	74.68	62.29	34.19	05.32	50.47	62.81	20.76	55.44
16	39.43	45.66	39.47	55.11	73.44	62.44	32.85	05.30	49.32	62.66	20.06	55.16
17	40.06	45.97	38.83	55.40	72.27	62.58	31.55	05.29	48.11	62.52	19.32	54.87
18	40.58	46.30	38.15	55.66	71.16	62.70	30.26	05.29	46.83	62.38	18.57	54.56
19	40.98	46.64	37.49	55.90	70.11	62.83	28.93	05.31	45.49	62.23	17.83	54.24
20	41.24	46.97	36.88	56.14	69.07	62.98	27.54	05.33	44.12	62.06	17.13	53.91
21	41.39	47.28	36.35	56.38	68.02	63.15	26.07	05.36	42.74	61.86	16.50	53.56
22	{41.46} {41.32}	{47.37} {47.83}	35.87	56.61	66.90	63.34	24.53	05.38	41.37	61.65	15.96	53.20
23	41.61	48.08	35.43	56.85	65.70	63.53	22.92	05.39	40.04	61.43	15.52	52.83
24	41.77	48.32	34.97	57.11	64.40	63.71	21.28	05.37	38.78	61.18	15.20	52.45
25	42.00	48.56	34.47	57.39	63.02	63.88	19.61	05.33	37.61	60.92	14.99	52.09
26	42.28	48.82	33.89	57.68	61.57	64.03	17.95	05.27	36.54	60.65	14.84	51.75
27	42.57	49.10	33.22	57.98	60.07	64.16	16.32	05.20	35.58	60.39	14.71	51.43
28	42.84	49.41	32.44	58.29	58.54	64.28	14.75	05.11	34.70	60.14	14.57	51.12
29	43.05	49.74	31.57	58.58	57.01	64.38	13.27	05.00	33.86	59.89	14.38	50.81
30	43.17	50.08	30.63	58.85	55.51	64.46	11.88	04.89	33.03	59.66	14.11	50.50
31	43.18	50.42	29.64	59.09	54.07	64.54	10.57	04.79	32.16	59.44	13.77	50.18
32	43.10	50.76	28.61	59.32			09.32	04.71			13.30	49.84

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

48 G Octantis Mag. 7.08

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s 20 27 84 37	—	^h ^m ^s 20 27 84 37	—	^h ^m ^s 20 27 84 37	—	^h ^m ^s 20 27 84 37	—	^h ^m ^s 20 27 84 37	—	^h ^m ^s 20 27 84 37	—
1	18.20	69.03	18.81	57.96	22.53	48.50	29.30	40.66	37.02	36.82	44.87	37.31
2	18.17	68.66	18.94	57.60	22.74	48.21	29.52	40.49	37.26	36.74	45.13	37.36
3	18.15	68.29	19.06	57.27	22.95	47.94	29.73	40.31	37.50	36.65	45.39	37.44
4	18.15	67.93	19.17	56.96	23.15	47.68	29.94	40.12	37.76	36.56	45.65	37.56
5	18.16	67.57	19.27	56.65	23.33	47.42	30.17	39.91	38.04	36.48	45.90	37.70
6	18.17	67.23	19.35	56.32	23.49	47.15	30.41	39.69	38.33	36.42	46.14	37.84
7	18.17	66.91	19.42	55.98	23.65	46.86	30.67	39.47	38.63	36.39	46.37	37.99
8	18.16	66.60	19.49	55.63	23.81	46.54	30.94	39.26	38.92	36.38	46.59	38.15
9	18.14	66.29	19.57	55.27	23.99	46.21	31.22	39.08	39.21	36.38	46.79	38.31
10	18.10	65.97	19.66	54.89	24.18	45.88	31.51	38.92	39.49	36.39	46.98	38.46
11	18.05	65.63	19.77	54.50	24.39	45.56	31.79	38.78	39.75	36.42	47.17	38.61
12	18.01	65.27	19.90	54.11	24.62	45.27	32.07	38.66	40.00	36.45	47.35	38.75
13	17.98	64.89	20.05	53.73	24.86	44.99	32.34	38.55	40.24	36.48	47.53	38.88
14	17.97	64.50	20.21	53.36	25.10	44.73	32.60	38.45	40.47	36.50	47.72	39.00
15	17.99	64.11	20.37	53.02	25.33	44.48	32.84	38.35	40.69	36.52	47.92	39.11
16	18.02	63.72	20.52	52.71	25.56	44.25	33.08	38.24	40.92	36.53	48.13	39.23
17	18.06	63.34	20.67	52.41	25.78	44.03	33.31	38.13	41.15	36.53	48.36	39.36
18	18.11	62.97	20.81	52.11	25.99	43.81	33.54	38.01	41.39	36.53	48.59	39.50
19	18.16	62.63	20.95	51.81	26.20	43.59	33.77	37.87	41.65	36.52	48.82	39.67
20	18.21	62.30	21.08	51.51	26.40	43.36	34.01	37.72	41.92	36.52	49.04	39.86
21	18.25	61.97	21.20	51.20	26.59	43.12	34.27	37.57	42.21	36.54	49.25	40.08
22	18.29	61.65	21.32	50.89	26.79	42.87	34.55	37.43	42.50	36.58	49.44	40.31
23	18.32	61.33	21.44	50.56	26.99	42.62	34.84	37.31	42.79	36.64	49.60	40.54
24	18.34	61.00	21.57	50.21	27.21	42.36	35.14	37.20	43.07	36.72	49.75	40.76
25	18.35	60.66	21.72	49.85	27.45	42.09	35.45	37.11	43.32	36.82	49.89	40.96
26	18.37	60.30	21.90	49.49	27.70	41.83	35.75	37.04	43.56	36.92	50.03	41.13
27	18.40	59.92	22.10	49.14	27.96	41.58	36.03	36.98	43.78	37.01	50.18	41.29
28	18.45	59.53	22.31	48.81	28.23	41.35	36.30	36.94	43.99	37.09	50.34	41.45
29	18.51	59.13	22.53	48.50	28.51	41.15	36.55	36.91	44.19	37.16	50.52	41.62
30	18.59	58.73			28.79	40.98	36.79	36.88	44.40	37.22	50.71	41.80
31	18.69	58.34			29.06	40.82	37.02	36.82	44.63	37.27	50.90	42.00
32	18.81	57.96			29.30	40.66			44.87	37.31		

Mean R.A. 20^h 27^m 25^s.07 Mean Dec. —84° 37' 59".49 Sec δ 10.69 Tan δ —10.64

AT UPPER TRANSIT AT GREENWICH

48 G Octantis Mag. 7.08

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s _°	^h ^m ^s _°	^h ^m ^s _°	^h ^m ^s _°	^h ^m ^s _°	^h ^m ^s _°	^h ^m ^s _°	^h ^m ^s _°	^h ^m ^s _°	^h ^m ^s _°	^h ^m ^s _°	^h ^m ^s _°
	20 27 84 37	20 27 84 37	20 27 84 37	20 27 84 37	20 27 84 37	20 27 84 37	20 27 84 38	20 27 84 38	20 27 84 38	20 27 84 37	20 27 84 37	20 27 84 37
1	50.90	42.00	53.99	50.36	52.80	59.04	48.24	05.15	41.71	06.70	35.81	62.88
2	51.08	42.23	54.00	50.68	52.67	59.28	48.05	05.25	41.52	06.66	35.65	62.71
3	51.25	42.48	54.00	50.99	52.55	59.51	47.87	05.35	41.33	06.64	35.48	62.53
4	51.41	42.74	53.99	51.29	52.43	59.73	47.70	05.46	41.13	06.63	35.30	62.33
5	51.55	43.01	53.97	51.57	52.32	59.94	47.54	05.58	40.91	06.61	35.11	62.11
6	51.67	43.28	53.95	51.83	52.23	60.15	47.37	05.71	40.67	06.58	34.93	61.87
7	51.78	43.55	53.94	52.09	52.14	60.38	47.19	05.85	40.42	06.53	34.76	61.60
8	51.89	43.81	53.94	52.34	52.06	60.62	46.99	05.99	40.18	06.46	34.60	61.31
9	51.98	44.05	53.95	52.59	51.97	60.88	46.78	06.13	39.94	06.36	34.47	61.01
10	52.07	44.28	53.98	52.84	51.86	61.15	46.55	06.26	39.71	06.23	34.36	60.72
11	52.17	44.49	54.01	53.11	51.73	61.42	46.31	06.36	39.50	06.09	34.26	60.44
12	52.28	44.70	54.03	53.41	51.58	61.68	46.07	06.43	39.31	05.94	34.16	60.18
13	52.40	44.91	54.04	53.73	51.41	61.93	45.83	06.47	39.13	05.79	34.06	59.93
14	52.53	45.12	54.04	54.06	51.23	62.16	45.60	06.50	38.96	05.66	33.95	59.68
15	52.67	45.35	54.01	54.38	51.06	62.35	45.39	06.53	38.79	05.55	33.83	59.44
16	52.82	45.61	53.96	54.69	50.89	62.51	45.20	06.56	38.61	05.45	33.70	59.20
17	52.96	45.89	53.89	54.98	50.73	62.67	45.02	06.60	38.42	05.35	33.57	58.95
18	53.08	46.18	53.82	55.25	50.58	62.83	44.84	06.64	38.21	05.25	33.43	58.68
19	53.18	46.48	53.75	55.50	50.44	62.99	44.65	06.69	38.00	05.14	33.29	58.40
20	53.25	46.78	53.69	55.74	50.31	63.17	44.45	06.75	37.78	05.02	33.16	58.10
21	53.31	47.07	53.64	55.97	50.18	63.37	44.23	06.82	37.56	04.88	33.04	57.79
22	53.35	47.34	53.60	56.21	50.04	63.58	44.00	06.90	37.34	04.71	32.93	57.46
23	53.39	47.60	53.56	56.47	49.88	63.80	43.76	06.97	37.12	04.52	32.84	57.12
24	53.44	47.84	53.52	56.74	49.70	64.02	43.51	07.01	36.91	04.31	32.77	56.78
25	53.49	48.07	53.48	57.03	49.51	64.23	43.26	07.02	36.71	04.10	32.71	56.44
26	53.55	48.31	53.43	57.33	49.31	64.42	43.01	07.01	36.53	03.89	32.67	56.11
27	53.63	48.56	53.36	57.64	49.09	64.60	42.76	06.98	36.37	03.67	32.63	55.80
28	53.72	48.82	53.27	57.95	48.87	64.76	42.52	06.94	36.23	03.46	32.59	55.51
29	53.80	49.10	53.17	58.25	48.65	64.91	42.29	06.89	36.10	03.25	32.54	55.23
30	{ 53.87 } { 53.93 }	{ 49.40 } { 49.71 }	53.05	58.53	48.44	65.04	42.08	06.83	35.96	03.06	32.47	54.94
31	53.97	50.03	52.93	58.79	48.24	65.15	41.89	06.76	35.81	02.88	32.39	54.64
32	53.99	50.36	52.80	59.04			41.71	06.70			32.30	54.32

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

 ν Octantis Mag. 5.74

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s ₁₀ ⁰⁰ ₁₀	—	^h ^m ^s ₁₀ ⁰⁰ ₁₀	—	^h ^m ^s ₁₀ ⁰⁰ ₁₀	—	^h ^m ^s ₁₀ ⁰⁰ ₁₀	—	^h ^m ^s ₁₀ ⁰⁰ ₁₀	—	^h ^m ^s ₁₀ ⁰⁰ ₁₀	—
1	41.30	14.11	36.41	64.08	36.39	53.38	41.15	42.12	49.20	33.80	59.53	29.30
2	41.06	13.81	36.39	63.69	36.52	52.99	41.36	41.83	49.46	33.59	59.89	29.20
3	40.84	13.51	36.38	63.33	36.65	52.62	41.55	41.53	49.73	33.36	60.26	29.11
4	40.64	13.20	36.36	62.99	36.77	52.27	41.73	41.21	50.02	33.12	60.65	29.04
5	40.47	12.90	36.32	62.65	36.87	51.92	41.91	40.87	50.34	32.88	61.04	29.00
6	40.32	12.60	36.26	62.31	36.94	51.56	42.11	40.52	50.68	32.64	61.42	28.97
7	40.17	12.33	36.18	61.97	37.00	51.20	42.34	40.17	51.04	32.42	61.79	28.96
8	40.00	12.07	36.09	61.61	37.06	50.82	42.59	39.82	51.41	32.22	62.15	28.98
9	39.80	11.82	36.00	61.23	37.13	50.43	42.86	39.48	51.78	32.04	62.49	29.01
10	39.58	11.57	35.93	60.83	37.21	50.02	43.14	39.15	52.14	31.88	62.81	29.03
11	39.35	11.30	35.88	60.41	37.32	49.60	43.43	38.85	52.49	31.74	63.12	29.05
12	39.12	11.00	35.85	59.98	37.46	49.19	43.72	38.56	52.83	31.60	63.42	29.07
13	38.90	10.68	35.85	59.56	37.62	48.79	44.01	38.29	53.16	31.47	63.72	29.07
14	38.69	10.34	35.87	59.16	37.79	48.40	44.30	38.03	53.47	31.35	64.03	29.05
15	38.50	09.98	35.91	58.77	37.97	48.02	44.57	37.78	53.77	31.23	64.34	29.02
16	38.33	09.62	35.95	58.40	38.15	47.67	44.82	37.54	54.06	31.09	64.68	28.99
17	38.19	09.27	35.99	58.05	38.33	47.33	45.06	37.29	54.36	30.93	65.03	28.97
18	38.07	08.93	36.02	57.70	38.50	47.01	45.30	37.03	54.67	30.76	65.40	28.98
19	37.96	08.61	36.04	57.35	38.65	46.69	45.54	36.77	55.00	30.59	65.78	29.00
20	37.85	08.29	36.05	57.00	38.79	46.36	45.78	36.50	55.35	30.43	66.17	29.04
21	37.74	07.98	36.05	56.64	38.92	46.02	46.04	36.22	55.72	30.27	66.55	29.11
22	37.62	07.67	36.04	56.27	39.05	45.67	46.32	35.92	56.11	30.12	66.90	29.19
23	37.49	07.37	36.03	55.89	39.19	45.31	46.63	35.62	56.51	29.99	67.22	29.28
24	37.35	07.07	36.03	55.49	39.34	44.94	46.96	35.33	56.91	29.90	67.51	29.37
25	37.19	06.76	36.05	55.08	39.50	44.56	47.31	35.06	57.29	29.83	67.78	29.45
26	37.03	06.42	36.10	54.66	39.68	44.17	47.66	34.81	57.64	29.78	68.05	29.51
27	36.88	06.06	36.17	54.23	39.90	43.78	48.00	34.58	57.97	29.73	68.32	29.57
28	36.74	05.69	36.27	53.80	40.15	43.40	48.33	34.38	58.28	29.67	68.61	29.62
29	36.62	05.30	36.39	53.38	40.41	43.05	48.64	34.19	58.58	29.59	68.92	29.67
30	36.52	04.90			40.67	42.72	48.93	34.00	58.88	29.50	69.25	29.72
31	36.45	04.49			40.92	42.41	49.20	33.80	59.19	29.40	69.60	29.78
32	36.41	04.08			41.15	42.12			59.53	29.30		

Mean R.A. $22^h 19^m 45^s.75$ Mean Dec. $-86^\circ 18' 00''.65$ Sec $\delta 15.50$ Tan $\delta -15.46$

APPARENT PLACES OF STARS, 1935

355

AT UPPER TRANSIT AT GREENWICH

ν Octantis Mag. 5.74

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₂₂ ^m ₂₀ ^s ₈₆ ^s ₁₇	—	^h ₂₂ ^m ₂₀ ^s ₈₆ ^s ₁₇	—	^h ₂₂ ^m ₂₀ ^s ₈₆ ^s ₁₇	—	^h ₂₂ ^m ₂₀ ^s ₈₆ ^s ₁₇	—	^h ₂₂ ^m ₂₀ ^s ₈₆ ^s ₁₇	—	^h ₂₂ ^m ₁₉ ^s ₈₆ ^s ₁₇	—
1	09.60	29.78	17.52	35.17	20.45	44.10	17.57	52.61	09.83	58.42	60.20	59.04
2	09.95	29.87	17.70	35.45	20.40	44.40	17.37	52.83	09.57	58.51	59.90	58.99
3	10.29	29.99	17.87	35.73	20.35	44.68	17.18	53.04	09.31	58.62	59.58	58.94
4	10.62	30.14	18.02	36.00	20.31	44.94	17.01	53.25	09.04	58.74	59.24	58.88
5	10.93	30.30	18.15	36.26	20.28	45.20	16.86	53.47	08.74	58.86	58.88	58.80
6	11.23	30.46	18.26	36.51	20.26	45.46	16.71	53.70	08.42	58.99	58.52	58.70
7	11.50	30.62	18.37	36.75	20.26	45.73	16.55	53.95	08.07	59.11	58.16	58.57
8	11.76	30.78	18.49	36.99	20.27	46.02	16.37	54.22	07.71	59.20	57.81	58.42
9	12.00	30.94	18.62	37.22	20.28	46.32	16.16	54.49	07.34	59.26	57.48	58.26
10	12.23	31.09	18.76	37.45	20.27	46.63	15.92	54.76	06.97	59.30	57.19	58.09
11	12.47	31.22	18.91	37.68	20.24	46.95	15.66	55.01	06.62	59.32	56.92	57.92
12	12.72	31.34	19.08	37.91	20.18	47.28	15.38	55.24	06.30	59.33	56.66	57.76
13	12.98	31.45	19.26	38.16	20.08	47.61	15.10	55.43	06.00	59.33	56.40	57.61
14	13.25	31.56	19.43	38.44	19.95	47.93	14.82	55.60	05.71	59.33	56.12	57.48
15	13.54	31.69	19.58	38.74	19.81	48.22	14.56	55.76	05.42	59.35	55.84	57.36
16	13.85	31.84	19.70	39.05	19.68	48.48	14.32	55.91	05.13	59.39	55.55	57.24
17	14.16	32.02	19.79	39.37	19.56	48.73	14.09	56.06	04.83	59.44	55.25	57.11
18	14.46	32.22	19.85	39.68	19.45	48.97	13.87	56.22	04.51	59.49	54.94	56.96
19	14.74	32.43	19.89	39.97	19.35	49.22	13.65	56.41	04.18	59.53	54.62	56.80
20	14.99	32.66	19.92	40.24	19.27	49.48	13.42	56.62	03.84	59.56	54.29	56.62
21	15.20	32.89	19.96	40.50	19.20	49.75	13.18	56.83	03.48	59.58	53.96	56.42
22	15.39	33.11	20.01	40.75	19.12	50.03	12.91	57.04	03.11	59.59	53.65	56.21
23	15.57	33.32	20.07	41.00	19.01	50.33	12.62	57.25	02.73	59.58	53.36	55.98
24	15.75	33.51	20.15	41.26	18.89	50.65	12.32	57.45	02.36	59.54	53.09	55.73
25	15.94	33.68	20.24	41.53	18.75	50.97	12.00	57.63	02.00	59.48	52.85	55.47
26	16.14	33.85	20.33	41.81	18.59	51.28	11.67	57.79	01.66	59.41	52.63	55.22
27	16.36	34.02	{ _{20.41} 42.12	{ _{42.12} 43.43	18.40	51.58	11.33	57.94	01.33	59.33	52.42	54.98
28	16.60	34.21	20.51	42.79	18.20	51.86	11.00	58.06	01.03	59.25	52.21	54.75
29	16.84	34.42	20.53	43.12	17.99	52.12	10.68	58.17	00.75	59.17	51.99	54.54
30	17.08	34.65	20.52	43.45	17.78	52.37	10.38	58.26	00.48	59.10	51.76	54.34
31	17.31	34.90	20.49	43.78	17.57	52.61	10.10	58.34	00.20	59.04	51.51	54.13
32	17.52	35.17	20.45	44.10			09.83	58.42			51.24	53.90

Catalogue Number 1390

Spectrum Ko

AT UPPER TRANSIT AT GREENWICH

 β Octantis Mag. 4.34

Day	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s	[°] ['] ["]	^h ^m ^s	[°] ['] ["]	^h ^m ^s	[°] ['] ["]	^h ^m ^s	[°] ['] ["]	^h ^m ^s	[°] ['] ["]	^h ^m ^s	[°] ['] ["]
	22 39 81	43	22 39 81	43	22 39 81	43	22 39 81	42	22 39 81	42	22 39 81	42
1	31.07	37.48	28.66	28.35	28.34	17.95	30.12	66.44	33.50	57.43	38.12	51.89
2	30.95	37.22	28.64	27.98	28.39	17.55	30.20	66.12	33.61	57.18	38.28	51.75
3	30.85	36.95	28.62	27.62	28.43	17.17	30.27	65.80	33.73	56.92	38.45	51.63
4	30.77	36.68	28.60	27.28	28.47	16.81	30.34	65.48	33.86	56.65	38.63	51.53
5	30.70	36.41	28.58	26.96	28.50	16.46	30.41	65.14	34.00	56.38	38.81	51.44
6	30.62	36.15	28.54	26.64	28.52	16.12	30.49	64.79	34.15	56.11	38.99	51.37
7	30.54	35.91	28.49	26.31	28.54	15.77	30.58	64.42	34.31	55.85	39.16	51.33
8	30.46	35.68	28.44	25.97	28.55	15.39	30.69	64.05	34.47	55.62	39.33	51.30
9	30.37	35.45	28.39	25.60	28.57	14.99	30.81	63.69	34.64	55.41	39.49	51.29
10	30.26	35.22	28.35	25.21	28.60	14.58	30.93	63.34	34.80	55.21	39.63	51.28
11	30.15	34.98	28.32	24.81	28.64	14.17	31.05	63.01	34.96	55.03	39.77	51.26
12	30.04	34.71	28.30	24.40	28.69	13.76	31.17	62.70	35.11	54.86	39.91	51.23
13	29.93	34.43	28.29	24.00	28.74	13.35	31.29	62.41	35.25	54.70	40.05	51.19
14	29.83	34.13	28.28	23.61	28.80	12.95	31.41	62.13	35.38	54.54	40.19	51.14
15	29.74	33.82	28.28	23.23	28.87	12.56	31.52	61.86	35.51	54.37	40.34	51.08
16	29.66	33.50	28.29	22.87	28.95	12.19	31.63	61.59	35.64	54.20	40.50	51.02
17	29.59	33.17	28.30	22.52	29.02	11.84	31.73	61.31	35.77	54.02	40.67	50.96
18	29.53	32.85	28.30	22.17	29.08	11.51	31.83	61.02	35.91	53.83	40.85	50.92
19	29.47	32.54	28.30	21.83	29.14	11.18	31.92	60.73	36.06	53.64	41.03	50.89
20	29.41	32.24	28.29	21.49	29.19	10.85	32.02	60.44	36.22	53.44	41.21	50.89
21	29.35	31.95	28.28	21.14	29.23	10.51	32.13	60.14	36.39	53.24	41.38	50.92
22	29.29	31.67	28.27	20.78	29.27	10.16	32.25	59.82	36.57	53.06	41.54	50.97
23	29.22	31.40	28.25	20.41	29.32	09.79	32.38	59.49	36.75	52.91	41.69	51.02
24	29.15	31.12	28.24	20.02	29.38	09.41	32.52	59.17	36.93	52.78	41.84	51.07
25	29.07	30.83	28.23	19.62	29.45	09.01	32.67	58.87	37.10	52.67	41.97	51.12
26	28.99	30.52	28.23	19.21	29.52	08.60	32.83	58.59	37.26	52.57	42.09	51.16
27	28.91	30.19	28.25	18.79	29.61	08.20	32.97	58.33	37.41	52.47	42.22	51.18
28	28.84	29.84	28.29	18.37	29.71	07.81	33.12	58.10	37.55	52.37	42.36	51.19
29	28.78	29.48	28.34	17.95	29.82	07.44	33.26	57.88	37.68	52.27	42.51	51.20
30	28.73	29.11			29.93	07.09	33.39	57.66	37.82	52.16	42.67	51.22
31	28.69	28.73			30.03	06.76	33.50	57.43	37.97	52.03	42.84	51.25
32	28.66	28.35			30.12	06.44			38.12	51.89		

Mean R.A. 22^h 39^m 32^s.04 Mean Dec. -81° 43' 23".67 Sec δ 6.95 Tan δ -6.87

APPARENT PLACES OF STARS, 1935

357

AT UPPER TRANSIT AT GREENWICH

β Octantis Mag. 4.34

Day	JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}	^h ^m ^s	[°] ['] ^{''}
	22 39 81	42	22 39 81	42	22 39 81	43	22 39 81	43	22 39 81	43	22 39 81	43
1	42.84	51.25	46.77	55.60	{48.37}	{03.70}	47.72	12.64	44.61	19.17	40.48	20.81
2	43.01	51.29	46.87	55.85	48.55	04.30	47.64	12.88	44.50	19.29	40.36	20.80
3	43.17	51.36	46.96	56.11	48.55	04.58	47.57	13.11	44.39	19.42	40.22	20.80
4	43.33	51.46	47.03	56.36	48.55	04.85	47.51	13.34	44.28	19.57	40.06	20.79
5	43.48	51.58	47.10	56.60	48.55	05.11	47.46	13.57	44.16	19.73	39.90	20.76
6	43.62	51.70	47.17	56.84	48.56	05.37	47.41	13.81	44.03	19.88	39.74	20.70
7	43.75	51.83	47.23	57.07	48.58	05.64	47.35	14.07	43.88	20.02	39.58	20.61
8	43.88	51.96	47.30	57.29	48.60	05.92	47.28	14.34	43.72	20.14	39.43	20.50
9	44.00	52.09	47.37	57.49	48.62	06.21	47.20	14.62	43.56	20.23	39.29	20.38
10	44.12	52.21	47.45	57.69	48.63	06.52	47.10	14.90	43.40	20.31	39.16	20.25
11	44.23	52.32	47.54	57.90	48.63	06.84	46.99	15.17	43.25	20.37	39.03	20.12
12	44.35	52.41	47.64	58.12	48.61	07.17	46.88	15.41	43.11	20.41	38.91	19.99
13	44.47	52.50	47.74	58.35	48.58	07.50	46.76	15.63	42.98	20.45	38.80	19.88
14	44.61	52.59	47.83	58.60	48.54	07.81	46.65	15.83	42.86	20.50	38.69	19.78
15	44.76	52.68	47.91	58.88	48.49	08.10	46.55	16.03	42.75	20.56	38.57	19.69
16	44.92	52.79	47.98	59.17	48.45	08.37	46.45	16.21	42.63	20.63	38.43	19.60
17	45.07	52.92	48.03	59.47	48.41	08.62	46.36	16.39	42.50	20.70	38.28	19.50
18	45.21	53.07	48.07	59.76	48.38	08.87	46.28	16.58	42.36	20.78	38.13	19.40
19	45.35	53.24	48.10	60.04	48.35	09.12	46.20	16.78	42.22	20.86	37.99	19.28
20	45.47	53.43	48.13	60.31	48.33	09.38	46.11	17.00	42.07	20.93	37.85	19.15
21	45.58	53.63	48.16	60.57	48.31	09.65	46.01	17.23	41.91	20.99	37.71	19.00
22	45.68	53.83	48.20	60.81	48.29	09.94	45.90	17.46	41.74	21.03	37.57	18.82
23	45.77	54.02	48.24	61.04	48.26	10.24	45.78	17.69	41.58	21.05	37.44	18.62
24	45.86	54.18	48.29	61.28	48.22	10.55	45.65	17.92	41.42	21.05	37.32	18.41
25	45.96	54.32	48.35	61.53	48.17	10.87	45.51	18.14	41.26	21.03	37.20	18.19
26	46.07	54.46	48.41	61.80	48.11	11.19	45.37	18.33	41.11	20.99	37.10	17.98
27	46.18	54.61	48.46	62.09	48.04	11.51	45.23	18.51	40.97	20.94	37.00	17.78
28	46.30	54.78	48.50	62.40	47.96	11.82	45.09	18.66	40.84	20.90	36.90	17.59
29	46.42	54.96	48.53	62.72	47.88	12.12	44.96	18.80	40.72	20.86	36.80	17.40
30	46.54	55.16	48.55	63.05	47.80	12.39	44.84	18.93	40.60	20.83	36.70	17.22
31	46.66	55.37	48.57	63.38	47.72	12.64	44.72	19.05	40.48	20.81	36.58	17.04
32	46.77	55.60	{48.57}	{63.70}			44.61	19.17			36.45	16.85

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	2 Ceti		α Andromedæ		β Cassiopeiæ	
Mag. Spect.	4.62	Ao	2.15	Aop	2.42	F5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 0 00	^m —17 41	^h 0 05	^m +28 43	^h 0 05	^m +58 47
Jan. 0.7	25.452 ¹¹⁰	53.21 ³¹	01.855 ¹³²	68.49 ⁸⁸	41.809 ³⁰²	51.45 ⁶⁸
10.7	25.344 ¹⁰¹	53.52 ⁸	01.723 ¹²⁶	67.61 ¹¹⁴	41.507 ²⁸⁹	50.77 ¹²⁰
20.7	25.241 ⁸⁸	53.60 ¹⁵	01.597 ¹¹⁴	66.47 ¹³⁵	41.218 ²⁶⁶	49.57 ¹⁶⁷
30.6	25.153 ⁷²	53.45 ⁴⁰	01.483 ⁹⁶	65.12 ¹⁵⁰	40.952 ²³⁰	47.90 ²⁰⁷
Feb. 9.6	25.081 ⁵⁰	53.05 ⁶⁴	01.387 ⁷¹	63.62 ¹⁵⁹	40.722 ¹⁸¹	45.83 ²³⁸
19.6	25.031	52.41 ⁸⁸	01.316 ⁴¹	62.03 ¹⁶¹	40.541 ¹²²	43.45 ²⁵⁹
Mar. 1.6	25.008 ²³	51.53 ¹¹³	01.275 ⁵	60.42 ¹⁵⁴	40.419 ⁵⁴	40.86 ²⁶⁹
11.5	25.015 ⁷	50.40 ¹³⁶	01.270 ³⁸	58.88 ¹⁴⁰	40.365 ²³	38.17 ²⁶⁷
21.5	25.057 ⁴²	49.04 ¹⁵⁹	01.308 ⁸²	57.48 ¹¹⁸	40.388 ¹⁰¹	35.50 ²⁵⁵
31.5	25.136 ¹¹⁸	47.45 ¹⁸⁰	01.390 ¹²⁸	56.30 ⁹¹	40.489 ¹⁸¹	32.95 ²³¹
Apr. 10.5	25.254 ¹⁵⁹	45.65 ¹⁹⁷	01.518 ¹⁷⁵	55.39 ⁵⁸	40.670 ²⁵⁸	30.64 ¹⁹⁹
20.4	25.413 ¹⁹⁸	43.68 ²¹²	01.693 ²²⁰	54.81 ²¹	40.928 ³³⁰	28.65 ¹⁵⁸
30.4	25.611 ²³⁵	41.56 ²²³	01.913 ²⁵⁹	54.60 ¹⁷	41.258 ³⁹³	27.07 ¹¹²
May 10.4	25.846 ²⁶⁶	39.33 ²²⁸	02.172 ²⁹⁴	54.77 ⁵⁷	41.651 ⁴⁴⁵	25.95 ⁶²
20.3	26.112 ²⁹³	37.05 ²²⁹	02.466 ³²²	55.34 ⁹⁵	42.096 ⁴⁸⁶	25.33 ¹⁰
30.3	26.405 ³¹³	34.76 ²²⁵	02.788 ³⁴⁰	56.29 ¹³¹	42.582 ⁵¹¹	25.23 ⁴⁴
June 9.3	26.718 ³²⁴	32.51 ²¹⁴	03.128 ³⁵⁰	57.60 ¹⁶⁴	43.093 ⁵²⁵	25.67 ⁹⁶
19.3	27.042 ³²⁸	30.37 ¹⁹⁸	03.478 ³⁵¹	59.24 ¹⁹³	43.618 ⁵²³	26.63 ¹⁴⁵
29.2	27.370 ³²³	28.39 ¹⁷⁸	03.829 ³⁴⁴	61.17 ²¹⁶	44.141 ⁵⁰⁹	28.08 ¹⁹⁰
July 9.2	27.693 ³¹⁰	26.61 ¹⁵²	04.173 ³²⁸	63.33 ²³⁴	44.650 ⁴⁸²	29.98 ²³⁰
19.2	28.003 ²⁸⁹	25.09 ¹²⁴	04.501 ³⁰⁴	65.67 ²⁴⁶	45.132 ⁴⁴⁶	32.28 ²⁶⁶
29.2	28.292 ²⁶¹	23.85 ⁹²	04.805 ²⁷⁴	68.13 ²⁵³	45.578 ³⁹⁹	34.94 ²⁹⁵
Aug. 8.1	28.553 ²²⁸	22.93 ⁶⁰	05.079 ²³⁹	70.66 ²⁵³	45.977 ³⁴⁵	37.89 ³¹⁶
18.1	28.781 ¹⁹⁰	22.33 ²⁶	05.318 ²⁰⁰	73.19 ²⁵⁰	46.322 ²⁸⁶	41.05 ³³³
28.1	28.971 ¹⁵⁰	22.07 ⁶	05.518 ¹⁶⁰	75.69 ²⁴⁰	46.608 ²²⁴	44.38 ³⁴²
Sept. 7.0	29.121 ¹⁰⁸	22.13 ³⁵	05.678 ¹¹⁸	78.09 ²²⁸	46.832 ¹⁶⁰	47.80 ³⁴³
17.0	29.229 ⁶⁷	22.48 ⁶²	05.796 ⁷⁸	80.37 ²¹⁰	46.992 ⁹⁶	51.23 ³³⁹
26.9	29.296 ²⁹	23.10 ⁸³	05.874 ³⁹	82.47 ¹⁹⁰	47.088 ³³	54.62 ³²⁷
Oct. 6.9	29.325 ⁷	23.93 ¹⁰⁰	05.913 ⁴	84.37 ¹⁶⁶	47.121 ²⁶	57.89 ³⁰⁸
16.9	29.318 ³⁸	24.93 ¹¹¹	05.917 ²⁸	86.03 ¹⁴¹	47.095 ⁸²	60.97 ²⁸⁴
26.9	29.280 ⁶⁴	26.04 ¹¹⁶	05.889 ⁵⁶	87.44 ¹¹⁴	47.013 ¹³⁴	63.81 ²⁵²
Nov. 5.9	29.216 ⁸⁵	27.20 ¹¹⁵	05.833 ⁷⁹	88.58 ⁸³	46.879 ¹⁸⁰	66.33 ²¹⁵
15.9	29.131 ¹⁰¹	28.35 ¹⁰⁹	05.754 ⁹⁹	89.41 ⁵⁴	46.699 ²²¹	68.48 ¹⁷²
25.8	29.030 ¹¹¹	29.44 ⁸⁴	05.655 ¹¹⁴	89.95 ²³	46.478 ²⁵⁴	70.20 ¹²³
Dec. 5.8	28.919 ¹¹⁸	30.42 ⁸⁴	05.541 ¹²⁶	90.18 ¹¹	46.224 ²⁸⁰	71.43 ⁷²
15.8	28.801 ¹¹⁹	31.26 ⁶⁶	05.415 ¹³²	90.07 ⁴²	45.944 ²⁹⁷	72.15 ¹⁸
25.7	28.682 ¹¹⁶	31.92 ⁴⁶	05.283 ¹³⁵	89.65 ⁷³	45.647 ³⁰⁵	72.33 ³⁷
35.7	28.566	32.38	05.148	88.92	45.342	71.96
Mean Place	24.670	51.66	01.310	53.96	41.708	28.84
Sec δ, Tan δ	1.050	— 0.319	1.140	+ 0.548	1.930	+ 1.651
α, α'	+3.1	+20.0	+3.1	+20.0	+3.1	+20.0
δ, δ'	—0.02	0.0	+0.04	0.0	+0.11	0.0
Authority and Catalogue No.	A.N.	1504	B.J.	3	B.J.	4

APPARENT PLACES OF STARS, 1935

359

AT UPPER TRANSIT AT GREENWICH

Name	γ Pegasi		ι Ceti		ζ Tucanae	
Mag. Spect.	2.87	B2	3.75	Ko	4.34	F8
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	$^h \ ^m \ ^s$ 0 09	$^{\circ} \ ' \ ''$ +14 49	$^h \ ^m \ ^s$ 0 16	$^{\circ} \ ' \ ''$ - 9 10	$^h \ ^m \ ^s$ 0 16	$^{\circ} \ ' \ ''$ -65 14
Jan. 0.7	53.775 ¹¹⁰	30.46 ⁸⁰	07.787 ¹⁰⁷	60.84 ⁵²	43.15 ⁴¹	96.67 ⁸⁰
10.7	53.665 ¹⁰⁵	29.66 ⁹¹	07.680 ¹⁰²	61.36 ³⁸	42.74 ³⁸	95.87 ¹³⁷
20.7	53.560 ⁹⁵	28.75 ⁹⁸	07.578 ⁹³	61.74 ²¹	42.36 ³⁴	94.50 ¹⁸⁸
30.7	53.465 ⁸¹	27.77 ¹⁰²	07.485 ⁷⁹	61.95 ³	42.02 ²⁹	92.62 ²³⁵
Feb. 9.6	53.384 ⁶⁰	26.75 ⁹⁹	07.406 ⁶⁰	61.98 ¹⁷	41.73 ²⁴	90.27 ²⁷⁷
19.6	53.324 ³⁴	25.76 ⁹³	07.346 ³⁶	61.81 ³⁸	41.49 ¹⁷	87.50 ³¹⁰
Mar. 1.6	53.290 ³	24.83 ⁷⁹	07.310 ⁸	61.43 ⁶⁰	41.32 ¹⁰	84.40 ³³⁷
11.5	53.287 ³⁴	24.04 ⁶¹	07.302 ²⁶	60.83 ⁸⁴	41.22 ²	81.03 ³⁵⁶
21.5	53.321 ⁷³	23.43 ³⁹	07.328 ⁶³	59.99 ¹⁰⁸	41.20 ⁵	77.47 ³⁶⁸
31.5	53.394 ¹¹⁵	23.04 ¹¹	07.391 ¹⁰²	58.91 ¹³¹	41.25 ¹³	73.79 ³⁷²
Apr. 10.5	53.509 ¹⁵⁷	22.93 ¹⁸	07.493 ¹⁴³	57.60 ¹⁵⁴	41.38 ²²	70.07 ³⁶⁸
20.4	53.666 ¹⁹⁸	23.11 ⁵⁰	07.636 ¹⁸²	56.06 ¹⁷³	41.60 ²⁹	66.39 ³⁵⁶
30.4	53.864 ²³⁶	23.61 ⁸²	07.818 ²²⁰	54.33 ¹⁹⁰	41.89 ³⁷	62.83 ³³⁶
May 10.4	54.100 ²⁶⁸	24.43 ¹¹²	08.038 ²⁵³	52.43 ²⁰⁴	42.26 ⁴⁴	59.47 ³¹¹
20.4	54.368 ²⁹⁵	25.55 ¹⁴⁰	08.291 ²⁸⁰	50.39 ²¹²	42.70 ⁵⁰	56.36 ²⁷⁷
30.3	54.663 ³¹⁴	26.95 ¹⁶⁶	08.571 ³⁰²	48.27 ²¹⁶	43.20 ⁵⁵	53.59 ²³⁷
June 9.3	54.977 ³²⁵	28.61 ¹⁸⁶	08.873 ³¹⁵	46.11 ²¹⁴	43.75 ⁵⁷	51.22 ¹⁹³
19.3	55.302 ³²⁸	30.47 ²⁰³	09.188 ³²¹	43.97 ²⁰⁹	44.32 ⁶⁰	49.29 ¹⁴²
29.2	55.630 ³²²	32.50 ²¹³	09.509 ³¹⁷	41.88 ¹⁹⁵	44.92 ⁶⁰	47.87 ⁹⁰
July 9.2	55.952 ³⁰⁹	34.63 ²¹⁹	09.826 ³⁰⁷	39.93 ¹⁷⁷	45.52 ⁵⁹	46.97 ³⁴
19.2	56.261 ²⁸⁹	36.82 ²¹⁸	10.133 ²⁸⁹	38.16 ¹⁵⁶	46.11 ⁵⁶	46.63 ²¹
29.2	56.550 ²⁶¹	39.00 ²¹⁴	10.422 ²⁶³	36.60 ¹³⁰	46.67 ⁵¹	46.84 ⁷⁵
Aug. 8.1	56.811 ²²⁹	41.14 ²⁰⁴	10.685 ²³³	35.30 ¹⁰³	47.18 ⁴⁵	47.59 ¹²⁷
18.1	57.040 ¹⁹⁴	43.18 ¹⁹⁰	10.918 ¹⁹⁸	34.27 ⁷³	47.63 ³⁸	48.86 ¹⁷⁴
28.1	57.234 ¹⁵⁶	45.08 ¹⁷³	11.116 ¹⁶⁰	33.54 ⁴³	48.01 ³⁰	50.60 ²¹⁵
Sept. 7.1	57.390 ¹¹⁸	46.81 ¹⁵⁴	11.276 ¹²²	33.11 ¹⁵	48.31 ²¹	52.75 ²⁴⁷
17.0	57.508 ⁸⁰	48.35 ¹³²	11.398 ⁸³	32.96 ¹²	48.52 ¹¹	55.22 ²⁷¹
26.9	57.588 ⁴⁴	49.67 ¹¹⁰	11.481 ⁴⁷	33.08 ³⁵	48.63 ⁷	57.93 ²⁸¹
Oct. 6.9	57.632 ¹¹	50.77 ⁸⁸	11.528 ¹³	33.43 ⁵⁵	48.64 ¹⁶	60.74 ²⁸⁴
16.9	57.643 ¹⁸	51.65 ⁶⁴	11.541 ¹⁸	33.98 ⁷¹	48.57 ¹⁶	63.58 ²⁷⁴
26.9	57.625 ⁴³	52.29 ⁴²	11.523 ⁴³	34.69 ⁸²	48.41 ²⁴	66.32 ²⁵¹
Nov. 5.9	57.582 ⁶⁴	52.71 ²¹	11.480 ⁶⁵	35.51 ⁸⁹	48.17 ³¹	68.83 ²¹⁹
15.9	57.518 ⁸²	52.92 ¹	11.415 ⁸³	36.40 ⁹⁰	47.86 ³⁶	71.02 ¹⁷⁸
25.8	57.436 ⁹⁵	52.91 ²¹	11.332 ⁹⁵	37.30 ⁸⁸	47.50 ³⁹	72.80 ¹²⁸
Dec. 5.8	57.341 ¹⁰⁵	52.70 ⁴⁰	11.237 ¹⁰⁴	38.18 ⁸²	47.11 ⁴²	74.08 ⁷⁴
15.8	57.236 ¹¹¹	52.30 ⁵⁸	11.133 ¹¹⁰	39.00 ⁷⁴	46.69 ⁴²	74.82 ¹⁶
25.8	57.125 ¹¹³	51.72 ⁷³	11.023 ¹¹¹	39.74 ⁶³	46.27 ⁴²	74.98 ⁴²
35.7	57.012	50.99	10.912	40.37	45.85	74.56
Mean Place	53.099	20.50	06.953	62.44	41.916	83.78
Sec δ , Tan δ	1.034	+ 0.265	1.013	- 0.162	2.389	- 2.170
a, a'	+3.1	+20.0	+3.1	+20.0	+2.9	+20.0
b, b'	+0.02	0.0	-0.01	- 0.1	-0.14	- 0.1
Authority and Catalogue No.	B.J.	10	B.J.	16	B.J.	17

† Second transit, Sept. 26

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name Mag. Spect.	δ Piscium		44 Piscium		β Hydri	
	5.58	Ko	5.99	G5	2.90	Go
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
Mean Solar Date						
	$^h \ ^m \ ^s$ 0 17	$^{\circ} \ ' \ ''$ + 7 49	$^h \ ^m \ ^s$ 0 22	$^{\circ} \ ' \ ''$ + 1 34	$^h \ ^m \ ^s$ 0 22	$^{\circ} \ ' \ ''$ -77 36
Jan. 0.7	15.760 ¹⁰⁶	53.66 ⁷³	04.959 ¹⁰⁷	53.57 ⁶⁸	23.71 ⁹⁰	87.19 ¹⁰³
10.7	15.654 ¹⁰²	52.93 ⁷⁶	04.852 ¹⁰²	52.89 ⁶²	22.81 ⁸⁶	86.16 ¹⁰²
20.7	15.552 ⁹⁴	52.17 ⁷⁷	04.750 ⁹³	52.27 ⁵⁸	21.95 ⁷⁷	84.54 ²¹⁶
30.7	15.458 ⁸¹	51.40 ⁷³	04.657 ⁸³	51.69 ⁵⁰	21.18 ⁶⁷	82.38 ²⁶⁴
Feb. 9.6	15.377 ⁶²	50.67 ⁶⁶	04.574 ⁶⁴	51.19 ³⁷	20.51 ⁵⁶	79.74 ³⁰⁵
19.6	15.315 ³⁷	50.01 ⁵⁵	04.510 ⁴¹	50.82 ²⁰	19.95 ⁴³	76.69 ³³⁸
Mar. 1.6	15.278 ⁸	49.46 ³⁸	04.469 ¹²	50.62 ³	19.52 ²⁸	73.31 ³⁶²
11.5	15.270 ²⁷	49.08 ¹⁹	04.457 ²¹	50.59 ¹⁸	19.24 ¹⁴	69.69 ³⁷⁹
21.5	15.297 ⁶⁴	48.89 ³	04.478 ⁶⁰	50.77 ⁴²	19.10 ²	65.90 ³⁸⁶
31.5	15.361 ¹⁰⁵	48.92 ³⁰	04.538 ¹⁰⁰	51.19 ⁷⁰	19.12 ¹⁷	62.04 ³⁸⁷
Apr. 10.5	15.466 ¹⁴⁶	49.22 ⁵⁷	04.638 ¹³⁹	51.89 ⁹²	19.29 ³³	58.17 ³⁷⁸
20.4	15.612 ¹⁸⁶	49.79 ⁸⁵	04.777 ¹⁷⁷	52.81 ¹¹⁷	19.62 ⁴⁷	54.39 ³⁶¹
30.4	15.798 ²²⁵	50.64 ¹¹³	04.954 ²¹⁷	53.98 ¹⁴²	20.09 ⁶²	50.78 ³³⁷
May 10.4	16.023 ²⁵⁷	51.77 ¹³⁸	05.171 ²⁵²	55.40 ¹⁶¹	20.71 ⁷⁴	47.41 ³⁰⁶
20.4	16.280 ²⁸⁴	53.15 ¹⁶¹	05.423 ²⁷⁹	57.01 ¹⁸²	21.45 ⁸⁵	44.35 ²⁶⁸
30.3	16.564 ³⁰⁵	54.76 ¹⁸⁰	05.702 ²⁹⁷	58.83 ¹⁹⁴	22.30 ⁹⁵	41.67 ²²³
June 9.3	16.869 ³¹⁸	56.56 ¹⁹⁵	05.999 ³¹²	60.77 ²⁰³	23.25 ¹⁰¹	39.44 ¹⁷⁴
19.3	17.187 ³²²	58.51 ²⁰⁴	06.311 ³²⁰	62.80 ²⁰⁵	24.26 ¹⁰⁵	37.70 ¹²⁰
29.2	17.509 ³¹⁸	60.55 ²⁰⁹	06.631 ³¹⁷	64.85 ²⁰⁴	25.31 ¹⁰⁷	36.50 ⁶⁵
July 9.2	17.827 ³⁰⁷	62.64 ²⁰⁷	06.948 ³⁰⁶	66.89 ¹⁹⁸	26.38 ¹⁰⁵	35.85 ⁷
19.2	18.134 ²⁸⁸	64.71 ²⁰²	07.254 ²⁸⁹	68.87 ¹⁸⁵	27.43 ¹⁰¹	35.78 ⁵¹
29.2	18.422 ²⁶³	66.73 ¹⁹⁰	07.543 ²⁶⁴	70.72 ¹⁶⁸	28.44 ⁹³	36.29 ¹⁰⁶
Aug. 8.1	18.685 ²³²	68.63 ¹⁷⁶	07.807 ²³⁴	72.40 ¹⁴⁹	29.37 ⁸²	37.35 ¹⁵⁹
18.1	18.917 ¹⁹⁸	70.39 ¹⁵⁶	08.041 ²⁰²	73.89 ¹²⁹	30.19 ⁷⁰	38.94 ²⁰⁵
28.1	19.115 ¹⁶¹	71.95 ¹³⁶	08.243 ¹⁶⁶	75.18 ¹⁰³	30.89 ⁵⁴	40.99 ²⁴⁶
Sept. 7.1	19.276 ¹²³	73.31 ¹¹⁵	08.409 ¹²⁷	76.21 ⁷⁷	31.43 ³⁷	43.45 ²⁷⁶
17.0	19.399 ⁸⁷	74.46 ⁹¹	08.536 ⁹¹	76.98 ⁵³	31.80 ¹⁸	46.21 ²⁹⁶
27.0	19.486 ⁵¹	75.37 ⁶⁷	08.627 ⁵³	77.51 ³¹	31.98 ²⁷	49.17 ³⁰⁶
Oct. 6.9	19.537 ¹⁸	76.04 ⁴⁶	08.680 ²³	77.82 ¹²	31.98 ¹⁹	52.23 ³⁰³
16.9	19.555 ¹¹	76.50 ²⁴	08.703 ⁶	77.89 ¹²	31.79 ³⁶	55.26 ²⁸⁸
26.9	19.544 ³⁶	76.74 ⁵	08.697 ³⁴	77.77 ²⁸	31.43 ⁵³	58.14 ²⁶²
Nov. 5.9	19.508 ⁵⁸	76.79 ¹²	08.663 ⁵⁴	77.49 ⁴²	30.90 ⁶⁷	60.76 ²²³
15.9	19.450 ⁷⁵	76.67 ²⁸	08.609 ⁷⁴	77.07 ⁵³	30.23 ⁷⁸	62.99 ¹⁷⁷
25.8	19.375 ⁸⁹	76.39 ⁴²	08.535 ⁸⁶	76.54 ⁶¹	29.45 ⁸⁷	64.76 ¹²²
Dec. 5.8	19.286 ⁹⁹	75.97 ⁵³	08.449 ⁹⁷	75.93 ⁶⁷	28.58 ⁹²	65.98 ⁶³
15.8	19.187 ¹⁰⁵	75.44 ⁶³	08.352 ¹⁰⁵	75.26 ⁶⁸	27.66 ⁹⁴	66.61 [—]
25.8	19.082 ¹⁰⁸	74.81 ⁷²	08.247 ¹⁰⁶	74.58 ⁷¹	26.72 ⁹³	66.61 ⁶³
35.7	18.974	74.09	08.141	73.87	25.79	65.98
Mean Place	14.999	46.02	04.139	48.06	21.979	73.25
Secd, Tan δ	1.009	+ 0.138	1.000	+ 0.028	4.664	- 4.556
a, a'	+3.1	+20.0	+3.1	+20.0	+2.5	+19.9
b, b'	+0.01	- 0.1	0.00	- 0.1	-0.30	- 0.1
Authority and Catalogue No.	N.A.	18	A.E.	21	B.J.	22

† Second transit, Sept. 26

† First transit, Sept. 27

APPARENT PLACES OF STARS, 1935

361

AT UPPER TRANSIT AT GREENWICH

Name	α Phoenicis		12 Ceti		ε Andromedæ	
	2.44	Ko	6.05	K5	4.52	G5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 0 23	— 42° 38'	^h ^m 0 26	— 4 18'	^h ^m 0 35	+ 28° 57'
Jan. 0.7	05.592 ¹⁸⁷	99.94 ¹⁰	44.119 ¹⁰⁶	54.83 ⁶¹	07.626 ¹³⁵	48.24 ⁶⁸
10.7	05.405 ¹⁷⁷	99.84 ⁵⁵	44.013 ¹⁰⁴	55.44 ⁵¹	07.491 ¹³⁶	47.56 ⁹⁴
20.7	05.228 ¹⁶¹	99.29 ⁹⁹	43.909 ⁹⁷	55.95 ³⁸	07.355 ¹³⁰	46.62 ¹¹⁷
30.7	05.067 ¹⁴⁰	98.30 ¹³⁹	43.812 ⁸⁵	56.33 ²⁵	07.225 ¹¹⁷	45.45 ¹³⁴
Feb. 9.6	04.927 ¹¹³	96.91 ¹⁷⁹	43.727 ⁶⁷	56.58 ⁸	07.108 ⁹⁸	44.11 ¹⁴⁶
19.6	04.814 ⁸¹	95.12 ²¹²	43.660 ⁴⁵	56.66 ¹¹	07.010 ⁷⁰	42.65 ¹⁵⁰
Mar. 1.6	04.733 ⁴²	93.00 ²⁴¹	43.615 ¹⁸	56.55 ³¹	06.940 ³⁷	41.15 ¹⁴⁸
11.6	04.691 [—]	90.59 ²⁶⁶	43.597 ¹⁶	56.24 ⁵⁴	06.903 ⁴	39.67 ¹³⁸
21.5	04.691 ⁴⁷	87.93 ²⁸⁶	43.613 ⁵³	55.70 ⁷⁷	06.907 ⁴⁸	38.29 ¹²²
31.5	04.738 ⁹⁶	85.07 ²⁹⁹	43.666 ⁹²	54.93 ¹⁰²	06.955 ⁹⁶	37.07 ⁹⁸
Apr. 10.5	04.834 ¹⁴⁷	82.08 ³⁰⁸	43.758 ¹³³	53.91 ¹²⁶	07.051 ¹⁴⁴	36.09 ⁶⁹
20.4	04.981 ¹⁹⁶	79.00 ³⁰⁹	43.891 ¹⁷⁴	52.65 ¹⁴⁸	07.195 ¹⁹¹	35.40 ³⁶
30.4	05.177 ²⁴³	75.91 ³⁰⁵	44.065 ²¹¹	51.17 ¹⁶⁹	07.386 ²³⁵	35.04 ¹
May 10.4	05.420 ²⁸⁶	72.86 ²⁹⁴	44.276 ²⁴⁶	49.48 ¹⁸⁵	07.621 ²⁷⁴	35.03 ³⁷
20.4	05.706 ³²⁴	69.92 ²⁷⁶	44.522 ²⁷⁵	47.63 ¹⁹⁹	07.895 ³⁰⁶	35.40 ⁷³
30.3	06.030 ³⁵³	67.16 ²⁵¹	44.797 ²⁹⁷	45.64 ²⁰⁷	08.201 ³³¹	36.13 ¹⁰⁹
June 9.3	06.383 ³⁷⁴	64.65 ²²⁰	45.094 ³¹¹	43.57 ²¹⁰	08.532 ³⁴⁷	37.22 ¹⁴²
19.3	06.757 ³⁸⁶	62.45 ¹⁸⁴	45.405 ³¹⁸	41.47 ²⁰⁹	08.879 ³⁵³	38.64 ¹⁷¹
29.3	07.143 ³⁸⁷	60.61 ¹⁴³	45.723 ³¹⁷	39.38 ²⁰¹	09.232 ³⁵¹	40.35 ¹⁹⁵
July 9.2	07.530 ³⁷⁸	59.18 ⁹⁹	46.040 ³⁰⁸	37.37 ¹⁸⁸	09.583 ³⁴⁰	42.30 ²¹⁴
19.2	07.908 ³⁵⁷	58.19 ⁵²	46.348 ²⁹¹	35.49 ¹⁷¹	09.923 ³²²	44.44 ²²⁹
29.2	08.265 ³³⁰	57.67 ⁴	46.639 ²⁶⁷	33.78 ¹⁵⁰	10.245 ²⁹⁷	46.73 ²³⁷
Aug. 8.1	08.595 ²⁹⁴	57.63 ⁴²	46.906 ²³⁹	32.28 ¹²⁵	10.542 ²⁶⁵	49.10 ²⁴¹
18.1	08.889 ²⁵⁰	58.05 ⁸⁷	47.145 ²⁰⁵	31.03 ⁹⁸	10.807 ²³⁰	51.51 ²³⁹
28.1	09.139 ²⁰¹	58.92 ¹³⁹	47.350 ¹⁶⁸	30.05 ⁷¹	11.037 ¹⁹²	53.90 ²³²
Sept. 7.1	09.340 ¹⁴⁹	60.21 ¹⁶⁴	47.518 ¹³²	29.34 ⁴⁴	11.229 ¹⁵²	56.22 ²²²
17.0	09.489 ⁹⁶	61.85 ¹⁹³	47.650 ⁹⁴	28.90 ¹⁷	11.381 ¹¹³	58.44 ²⁰⁷
27.0	09.585 ⁴³	63.78 ²¹³	47.744 ⁵⁸	28.73 ⁷	11.494 ⁷⁶	60.51 ¹⁸⁹
Oct. 6.9	09.628 ⁷	65.91 ²²⁵	47.802 ²⁵	28.80 ²⁸	11.570 ³⁹	62.40 ¹⁶⁹
16.9	09.621 ⁵²	68.16 ²²⁷	47.827 ⁵	29.08 ⁴⁶	11.609 ⁵	64.09 ¹⁴⁶
26.9	09.569 ⁹²	70.43 ²¹⁹	47.822 ³¹	29.54 ⁶⁰	11.614 ²⁵	65.55 ¹²¹
Nov. 5.9	09.477 ¹²⁷	72.62 ²⁰²	47.791 ⁵⁴	30.14 ⁷⁰	11.589 ⁵¹	66.76 ⁹⁵
15.9	09.350 ¹⁵³	74.64 ¹⁷⁵	47.737 ⁷²	30.84 ⁷⁶	11.538 ⁷⁵	67.71 ⁶⁶
25.8	09.197 ¹⁷⁴	76.39 ¹⁴⁵	47.665 ⁸⁷	31.60 ⁷⁸	11.463 ⁹⁶	68.37 ³⁷
Dec. 5.8	09.023 ¹⁸⁶	77.84 ¹⁰⁶	47.578 ⁹⁸	32.38 ⁷⁸	11.367 ¹¹³	68.74 ⁷
15.8	08.837 ¹⁹³	78.90 ⁶⁵	47.480 ¹⁰⁵	33.16 ⁷⁴	11.254 ¹²⁶	68.81 ²³
25.8	08.644 ¹⁹⁴	79.55 ²⁰	47.375 ¹⁰⁹	33.90 ⁶⁸	11.128 ¹³⁵	68.58 ⁵³
35.7	08.450	79.75	47.266	34.58	10.993	68.05
Mean Place	04.549	91.41	43.246	58.30	06.851	33.05
Secδ, Tanδ	1.360	— 0.921	1.003	— 0.075	1.143	+ 0.553
a, a'	+2.9	+19.9	+3.1	+19.9	+3.2	+19.8
b, b'	— 0.06	— 0.1	— 0.01	— 0.1	+ 0.04	— 0.2
Authority and Catalogue No.	B.J.	23	B.J.	25	A.N.	35

† First transit, Sept. 27

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	δ Andromedæ		α Cassiopeïæ		β Ceti	
Mag. Spect.	3.49	K2	Var.	Ko	2.24	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 0 35	^m +30 30	^h 0 36	^m +56 10	^h 0 40	^m -18 20
Jan. 0.7	51.474 ¹³⁹	35.70 ⁶⁶	48.830 ²⁷⁴	75.34 ³⁵	20.665 ¹²¹	36.06 ⁴⁸
10.7	51.335 ¹³⁹	35.04 ⁹⁴	48.556 ²⁷⁴	74.99 ⁸⁶	20.544 ¹²⁰	36.54 ²³
20.7	51.196 ¹³³	34.10 ¹¹⁸	48.282 ²⁶²	74.13 ¹³²	20.424 ¹¹³	36.77 ³
30.7	51.063 ¹²¹	32.92 ¹³⁷	48.020 ²³⁹	72.81 ¹⁷⁵	20.311 ¹⁰³	36.74 ³⁰
Feb. 9.6	50.942 ¹⁰⁰	31.55 ¹⁵⁰	47.781 ²⁰²	71.06 ²⁰⁸	20.208 ⁸⁶	36.44 ⁵⁶
19.6	50.842 ⁷³	30.05 ¹⁵⁷	47.579 ¹⁵³	68.98 ²³⁴	20.122 ⁶³	35.88 ⁸⁴
Mar. 1.6	50.769 ³⁸	28.48 ¹⁵⁴	47.426 ⁹⁵	66.64 ²⁴⁹	20.059 ³⁵	35.04 ¹¹⁰
11.6	50.731 ³	26.94 ¹⁴⁶	47.331 ²⁸	64.15 ²⁵³	20.024 ³	33.94 ¹³⁵
21.5	50.734 ⁴⁸	25.48 ¹²⁹	47.303 ⁴⁵	61.62 ²⁴⁶	20.021 ³⁵	32.59 ¹⁶⁰
31.5	50.782 ⁹⁷	24.19 ¹⁰⁷	47.348 ¹²⁰	59.16 ²³⁰	20.056 ⁷⁶	30.99 ¹⁸³
Apr. 10.5	50.879 ¹⁴⁵	23.12 ⁷⁸	47.468 ¹⁹⁶	56.86 ²⁰³	20.132 ¹¹⁸	29.16 ²⁰²
20.4	51.024 ¹⁹⁴	22.34 ⁴⁴	47.664 ²⁶⁸	54.83 ¹⁶⁹	20.250 ¹⁶⁰	27.14 ²¹⁸
30.4	51.218 ²³⁸	21.90 ⁸	47.932 ³³⁴	53.14 ¹²⁸	20.410 ²⁰⁰	24.96 ²³¹
May 10.4	51.456 ²⁷⁸	21.82 ²⁹	48.266 ³⁹⁰	51.86 ⁸²	20.610 ²³⁸	22.65 ²³⁸
20.4	51.734 ³¹¹	22.11 ⁶⁸	48.656 ⁴³⁶	51.04 ³⁴	20.848 ²⁷⁰	20.27 ²⁴⁰
30.3	52.045 ³³⁵	22.79 ¹⁰⁴	49.092 ⁴⁷⁰	50.70 ¹⁶	21.118 ²⁹⁶	17.87 ²³⁷
June 9.3	52.380 ³⁵²	23.83 ¹³⁷	49.562 ⁴⁹²	50.86 ⁶⁶	21.414 ³¹⁴	15.50 ²²⁸
19.3	52.732 ³⁵⁷	25.20 ¹⁶⁹	50.054 ⁴⁹⁹	51.52 ¹¹³	21.728 ³²⁵	13.22 ²¹²
29.3	53.089 ³⁵⁶	26.89 ¹⁹⁴	50.553 ⁴⁹⁶	52.65 ¹⁵⁹	22.053 ³²⁷	11.10 ¹⁹²
July 9.2	53.445 ³⁴⁵	28.83 ²¹⁴	51.049 ⁴⁷⁹	54.24 ¹⁹⁹	22.380 ³²⁰	09.18 ¹⁶⁷
19.2	53.790 ³²⁷	30.97 ²³⁰	51.528 ⁴⁵³	56.23 ²³⁵	22.700 ³⁰⁵	07.51 ¹³⁷
29.2	54.117 ³⁰⁰	33.27 ²⁴⁰	51.981 ⁴¹⁶	58.58 ²⁶⁵	23.005 ²⁸⁴	06.14 ¹⁰⁴
Aug. 8.1	54.417 ²⁶⁹	35.67 ²⁴⁵	52.397 ³⁷²	61.23 ²⁹⁰	23.289 ²⁵⁶	05.10 ⁷⁰
18.1	54.686 ²³⁴	38.12 ²⁴⁵	52.769 ³²²	64.13 ³⁰⁸	23.545 ²²³	04.40 ³⁴
28.1	54.920 ¹⁹⁵	40.57 ²³⁹	53.091 ²⁶⁸	67.21 ³¹⁹	23.768 ¹⁸⁶	04.06 ²
Sept. 7.1	55.115 ¹⁵⁶	42.96 ²²⁹	53.359 ²¹⁰	70.40 ³²⁶	23.954 ¹⁴⁸	04.08 ³⁵
17.0	55.271 ¹¹⁶	45.25 ²¹⁵	53.569 ¹⁵³	73.66 ³²⁴	24.102 ¹⁰⁸	04.43 ⁶⁵
27.0	55.387 ⁷⁷	47.40 ¹⁹⁸	53.722 ⁹⁶	76.90 ³¹⁷	24.210 ⁷⁰	05.08 ⁹¹
Oct. 6.9	55.464 ⁴¹	49.38 ¹⁷⁸	53.818 ³²	80.07 ³⁰⁴	24.280 ³³	05.99 ¹¹¹
16.9	55.505 ⁷	51.16 ¹⁵⁶	53.857 ¹⁶	83.11 ²⁸³	24.313 [—]	07.10 ¹²⁵
26.9	55.512 ²⁴	52.72 ¹³⁰	53.841 ⁶⁶	85.94 ²⁵⁸	24.313 ³⁰	08.35 ¹³³
Nov. 5.9	55.488 ⁵¹	54.02 ¹⁰³	53.775 ¹¹³	88.52 ²²⁵	24.283 ⁵⁶	09.68 ¹³⁵
15.9	55.437 ⁷⁶	55.05 ⁷⁴	53.662 ¹⁵⁸	90.77 ¹⁸⁷	24.227 ⁷⁷	11.03 ¹³⁰
25.8	55.361 ⁹⁷	55.79 ⁴⁴	53.504 ¹⁹⁵	92.64 ¹⁴⁵	24.150 ⁹⁴	12.33 ¹²⁰
Dec. 5.8	55.264 ¹¹⁵	56.23 ¹³	53.309 ²²⁸	94.09 ⁹⁷	24.056 ¹⁰⁸	13.53 ¹⁰⁵
15.8	55.149 ¹²⁸	56.36 ¹⁹	53.081 ²⁵⁴	95.06 ⁴⁷	23.948 ¹¹⁷	14.58 ⁸⁷
25.8	55.021 ¹³⁸	56.17 ⁴⁹	52.827 ²⁷⁰	95.53 ⁵	23.831 ¹²³	15.45 ⁶⁵
35.7	54.883	55.68	52.557	95.48	23.708	16.10
Mean Place	50.700	20.00	48.246	52.62	19.654	34.92
Sec δ , Tan δ	1.161	+0.589	1.797	+1.493	1.054	-0.332
a, a'	+3.2	+19.8	+3.4	+19.8	+3.0	+19.7
b, b'	+0.04	-0.2	+0.10	-0.2	-0.02	-0.2
Authority and Catalogue No.	B.J.	36	B.J.	37	B.J.	39

APPARENT PLACES OF STARS, 1935

363

AT UPPER TRANSIT AT GREENWICH

Name	δ Piscium		20 Ceti		γ Cassiopeiae	
Mag. Spect.	4.55	K5	4.92	K0	2.25	B0p
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 0 45	^m + 7 13	^h 0 49	^m - 1 29	^h 0 52	^m + 60 21
Jan. 0.8	19.368 ¹⁰⁸	61.93 ⁶⁸	42.046 ¹⁰⁹	43.64 ⁶⁵	46.80 ³²	78.64 ⁸
10.7	19.260 ¹⁰⁹	61.25 ⁷⁰	41.937 ¹⁰⁹	44.29 ⁵⁹	46.48 ³³	78.56 ⁶³
20.7	19.151 ¹⁰⁶	60.55 ⁷⁰	41.828 ¹⁰⁹	44.88 ⁴⁹	46.15 ³¹	77.93 ¹¹³
30.7	19.045 ⁹⁸	59.85 ⁶⁷	41.719 ¹⁰⁰	45.37 ³⁷	45.84 ³⁰	76.80 ¹⁵⁹
Feb. 9.6	18.947 ⁸³	59.18 ⁵⁹	41.619 ⁸⁴	45.74 ²²	45.54 ²⁶	75.21 ¹⁹⁸
19.6	18.864 ⁶¹	58.59 ⁴⁹	41.535 ⁶⁴	45.96 ⁶	45.28 ²⁰	73.23 ²³⁰
Mar. 1.6	18.803 ³⁴	58.10 ³⁴	41.471 ⁴⁰	46.02 ¹⁵	45.08 ¹⁴	70.93 ²⁵⁰
11.6	18.769 ²	57.76 ¹⁵	41.431 ⁶	45.87 ³⁶	44.94 ⁷	68.43 ²⁶¹
21.5	18.767 ³⁶	57.61 ⁵	41.425 ³⁰	45.51 ⁵⁹	44.87 ¹	65.82 ²⁵⁹
31.5	18.803 ⁷⁷	57.66 ³⁰	41.455 ⁷⁰	44.92 ⁸³	44.88 ¹⁰	63.23 ²⁴⁸
Apr. 10.5	18.880 ¹¹⁹	57.96 ⁵⁶	41.525 ¹¹²	44.09 ¹⁰⁷	44.98 ¹⁹	60.75 ²²⁵
20.5	18.999 ¹⁶²	58.52 ⁸²	41.637 ¹⁵³	43.02 ¹³⁰	45.17 ²⁷	58.50 ¹⁹⁶
30.4	19.161 ²⁰²	59.34 ¹⁰⁹	41.790 ¹⁹⁴	41.72 ¹⁵³	45.44 ³⁴	56.54 ¹⁵⁷
May 10.4	19.363 ²³⁸	60.43 ¹³³	41.984 ²³⁰	40.19 ¹⁷¹	45.78 ⁴¹	54.97 ¹¹⁴
20.4	19.601 ²⁶⁹	61.76 ¹⁵⁶	42.214 ²⁶¹	38.48 ¹⁸⁷	46.19 ⁴⁷	53.83 ⁶⁶
30.3	19.870 ²⁹⁴	63.32 ¹⁷⁴	42.475 ²⁸⁸	36.61 ¹⁹⁹	46.66 ⁵¹	53.17 ¹⁶
June 9.3	20.164 ³¹¹	65.06 ¹⁸⁸	42.763 ³⁰⁶	34.62 ²⁰⁵	47.17 ⁵³	53.01 ³⁵
19.3	20.475 ³²⁰	66.94 ¹⁹⁷	43.069 ³¹⁶	32.57 ²⁰⁴	47.70 ⁵⁵	53.36 ⁸²
29.3	20.795 ³²¹	68.91 ²⁰²	43.385 ³¹⁸	30.53 ²⁰³	48.25 ⁵⁵	54.18 ¹³¹
July 9.2	21.116 ³¹⁴	70.93 ²⁰¹	43.703 ³¹²	28.50 ¹⁹⁴	48.80 ⁵⁴	55.49 ¹⁷⁵
19.2	21.430 ³⁰⁰	72.94 ¹⁹⁵	44.015 ²⁹⁹	26.56 ¹⁷⁸	49.34 ⁵¹	57.24 ²¹⁴
29.2	21.730 ²⁷⁸	74.89 ¹⁸⁴	44.314 ²⁷⁸	24.78 ¹⁶⁰	49.85 ⁴⁸	59.38 ²⁴⁹
Aug. 8.2	22.008 ²⁵¹	76.73 ¹⁶⁹	44.592 ²⁵³	23.18 ¹³⁷	50.33 ⁴⁴	61.87 ²⁷⁸
18.1	22.259 ²²¹	78.42 ¹⁵¹	44.845 ²²⁰	21.81 ¹¹³	50.77 ³⁸	64.65 ³⁰⁰
28.1	22.480 ¹⁸⁶	79.93 ¹³¹	45.065 ¹⁹⁰	20.68 ⁸⁷	51.15 ³²	67.65 ³¹⁸
Sept. 7.1	22.666 ¹⁵⁰	81.24 ¹⁰⁸	45.255 ¹⁵³	19.81 ⁶⁰	51.47 ²⁶	70.83 ³²⁷
17.0	22.816 ¹¹⁵	82.32 ⁸⁴	45.408 ¹¹⁷	19.21 ³¹	51.73 ²⁰	74.10 ³³²
27.0	22.931 ⁸¹	83.16 ⁶²	45.525 ⁸²	18.90 ¹⁰	51.93 ¹⁴	77.42 ³²⁹
Oct. 6.9	23.012 ⁴⁷	83.78 ³⁹	45.607 ⁴⁸	18.80 ¹⁶	52.07 ⁷	80.71 ³¹⁹
16.9	23.059 ¹⁷	84.17 ¹⁹	45.655 ¹⁹	18.96 ³³	52.14 ¹	83.90 ³⁰⁴
26.9	23.076 ¹¹	84.36 [—]	45.674 ⁸	19.29 ⁴⁹	52.15 ⁵	86.94 ²⁸⁰
Nov. 5.9	23.065 ³⁴	84.36 ¹⁶	45.666 ³⁶	19.78 ⁶¹	52.10 ¹⁰	89.74 ²⁵¹
15.9	23.031 ⁵⁶	84.20 ³¹	45.630 ⁵⁴	20.39 ⁷⁰	52.00 ¹⁶	92.25 ²¹⁶
25.9	22.975 ⁷³	83.89 ⁴³	45.576 ⁷⁴	21.09 ⁷³	51.84 ²¹	94.41 ¹⁷⁴
Dec. 5.8	22.902 ⁸⁸	83.46 ⁵³	45.502 ⁸⁷	21.82 ⁷⁶	51.63 ²⁵	96.15 ¹²⁸
15.8	22.814 ¹⁰⁰	82.93 ⁶²	45.415 ⁹⁹	22.58 ⁷⁵	51.38 ²⁹	97.43 ⁷⁶
25.8	22.714 ¹⁰⁷	82.31 ⁶⁸	45.316 ¹⁰⁷	23.33 ⁷⁰	51.09 ³¹	98.19 ²³
35.7	22.607	81.63	45.209	24.03	50.78	98.42
Mean Place	18.431	54.07	41.050	48.46	46.032	54.88
Secδ, Tanδ	1.008	+ 0.127	1.000	- 0.026	2.022	+ 1.758
a, a'	+3.1	+19.7	+3.1	+19.6	+3.6	+19.5
b, b'	+0.01	- 0.2	0.00	- 0.2	+0.11	- 0.2
Authority and Catalogue No.	A.N.	47	A.E.	52	B.J.	53

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	μ Andromedæ		α Sculptoris		ϵ Piscium	
	3.94	A ₂	4.39	B ₅	4.45	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 0 53	^m +38° 08'	^h 0 55	^m -29° 41'	^h 0 59	^m +7° 32'
Jan. 0.8	09.098	68.18	29.666	94.38	35.014	34.49
10.7	08.937	67.73	29.518	94.81	34.905	33.83
20.7	08.771	66.93	29.370	94.87	34.792	33.14
30.7	08.609	65.81	29.227	94.57	34.679	32.46
Feb. 9.7	08.457	64.41	29.095	93.90	34.573	31.81
19.6	08.325	62.80	28.980	92.89	34.480	31.23
Mar. 1.6	08.222	61.05	28.887	91.54	34.406	30.74
11.6	08.155	59.24	28.824	89.88	34.358	30.39
21.5	08.133	57.45	28.796	87.93	34.343	30.22
31.5	08.161	55.77	28.806	85.73	34.364	30.25
Apr. 10.5	08.242	54.27	28.861	83.31	34.427	30.51
20.5	08.378	53.03	28.960	80.74	34.532	31.03
30.4	08.567	52.11	29.105	78.03	34.680	31.81
May 10.4	08.807	51.55	29.295	75.27	34.870	32.85
20.4	09.092	51.38	29.527	72.49	35.098	34.13
30.4	09.415	51.61	29.795	69.77	35.359	35.63
June 9.3	09.767	52.24	30.094	67.16	35.646	37.32
19.3	10.140	53.26	30.416	64.74	35.953	39.16
29.3	10.522	54.63	30.753	62.55	36.272	41.09
July 9.2	10.906	56.34	31.096	60.67	36.593	43.07
19.2	11.281	58.32	31.435	59.14	36.909	45.06
29.2	11.640	60.54	31.763	57.99	37.213	46.98
Aug. 8.2	11.973	62.93	32.071	57.25	37.498	48.81
18.1	12.276	65.44	32.352	56.94	37.758	50.50
28.1	12.544	68.03	32.600	57.06	37.989	52.00
Sept. 7.1	12.772	70.63	32.810	57.60	38.187	53.30
17.1	12.959	73.19	32.979	58.52	38.351	54.38
27.0	13.105	75.67	33.105	59.77	38.480	55.23
Oct. 6.9	13.209	78.03	33.189†	61.29	38.574†	55.85
16.9	13.274	80.22	33.232	63.03	38.636	56.25
26.9	13.301	82.21	33.237	64.88	38.667	56.44
Nov. 5.9	13.292	83.96	33.206	66.78	38.670	56.45
15.9	13.251	85.44	33.144	68.64	38.648	56.30
25.9	13.179	86.62	33.056	70.38	38.604	56.00
Dec. 5.8	13.081	87.46	32.946	71.93	38.539	55.58
15.8	12.958	87.95	32.819	73.22	38.457	55.06
25.8	12.816	88.08	32.678	74.22	38.361	54.46
35.8	12.660	87.84	32.530	74.89	38.254	53.81
Mean Place	08.211	49.93	28.512	89.89	33.988	26.34
Secδ, Tanδ	1.272	+0.785	1.151	-0.571	1.009	+0.132
a, a'	+3.3	+19.5	+2.9	+19.5	+3.1	+19.4
b, b'	+0.05	-0.2	-0.04	-0.2	+0.01	-0.3
Authority and Catalogue No.	B.J.	55	B.J.	57	B.J.	59

† Second transit, Oct. 6

† First transit, Oct. 7

APPARENT PLACES OF STARS, 1935

365

AT UPPER TRANSIT AT GREENWICH

Name	72 Piscium		β Phoenicis <i>m.</i>		β Andromedæ	
Mag. Spect.	5.65	F2	3.35	Ko	2.37	Ma
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h _I ^m ₀₁	[°] ₊₁₄ ['] ₃₅	^h _I ^m ₀₃	[°] ₋₄₇ ['] ₀₃	^h _I ^m ₀₆	[°] ₊₃₅ ['] ₁₆
Jan. 0.8	40.256 ¹¹³	60.22 ⁶³	12.532 ²²⁶	67.24 ²³	06.079 ¹⁴⁹	52.73 ⁴⁰
10.7	40.143 ¹¹⁸	59.59 ⁷³	12.306 ²²⁵	67.47 ²⁷	05.930 ¹⁵⁷	52.33 ⁷¹
20.7	40.025 ¹¹⁸	58.86 ⁸⁰	12.081 ²¹⁷	67.20 ⁷⁷	05.773 ¹⁵⁷	51.62 ¹⁰⁰
30.7	39.907 ¹¹¹	58.06 ⁸⁵	11.864 ²⁰¹	66.43 ¹²³	05.616 ¹⁵⁰	50.62 ¹²⁶
Feb. 9.7	39.796 ⁹⁹	57.21 ⁸⁴	11.663 ¹⁷⁸	65.20 ¹⁶⁸	05.466 ¹³⁴	49.36 ¹⁴⁶
19.6	39.697 ⁷⁷	56.37 ⁸⁰	11.485 ¹⁴⁰	63.52 ²⁰⁷	05.332 ¹⁰⁸	47.90 ¹⁵⁹
Mar. 1.6	39.620 ⁵²	55.57 ⁷¹	11.336 ¹¹²	61.45 ²⁴⁴	05.224 ⁷⁵	46.31 ¹⁶⁵
11.6	39.568 ¹⁸	54.86 ⁵⁷	11.224 ⁶⁹	59.01 ²⁷³	05.149 ³⁴	44.66 ¹⁶³
21.5	39.550 ²⁰	54.29 ³⁹	11.155 ²⁰	56.28 ²⁹⁷	05.115 ¹³	43.03 ¹⁵⁴
31.5	39.570 ⁶³	53.90 ¹⁶	11.135 ³³	53.31 ³¹⁵	05.128 ⁶⁵	41.49 ¹³⁶
Apr. 10.5	39.633 ¹⁰⁶	53.74 ⁹	11.168 ⁸⁷	50.16 ³²⁸	05.193 ¹¹⁸	40.13 ¹¹²
20.5	39.739 ¹⁵²	53.83 ³⁶	11.255 ¹⁴⁴	46.88 ³³³	05.311 ¹⁷⁰	39.01 ⁸³
30.4	39.891 ¹⁹⁴	54.19 ⁶⁵	11.399 ¹⁹⁸	43.55 ³³⁰	05.481 ²²¹	38.18 ⁴⁹
May 10.4	40.085 ²³³	54.84 ⁹³	11.597 ²⁵⁰	40.25 ³²²	05.702 ²⁶⁷	37.69 ¹³
20.4	40.318 ²⁶⁶	55.77 ¹²⁰	11.847 ²⁹⁷	37.03 ³⁰⁵	05.969 ³⁰⁵	37.56 ²⁶
30.4	40.584 ²⁹⁴	56.97 ¹⁴⁴	12.144 ³³⁶	33.98 ²⁸²	06.274 ³³⁶	37.82 ⁶³
June 9.3	40.878 ³¹³	58.41 ¹⁶⁴	12.480 ³⁶⁷	31.16 ²⁵¹	06.610 ³⁵⁸	38.45 ⁹⁹
19.3	41.191 ³²⁵	60.05 ¹⁸¹	12.847 ³⁹⁰	28.65 ²¹⁶	06.968 ³⁷⁰	39.44 ¹³³
29.3	41.516 ³²⁸	61.86 ¹⁹³	13.237 ⁴⁰⁰	26.49 ¹⁷²	07.338 ³⁷⁴	40.77 ¹⁶³
July 9.2	41.844 ³²⁴	63.79 ²⁰⁰	13.637 ⁴⁰¹	24.77 ¹²⁶	07.712 ³⁶⁹	42.40 ¹⁸⁹
19.2	42.168 ³¹⁰	65.79 ²⁰¹	14.038 ³⁹¹	23.51 ⁷⁶	08.081 ³⁵⁵	44.29 ²⁰⁹
29.2	42.478 ²⁹²	67.80 ¹⁹⁸	14.429 ³⁶⁹	22.75 ²⁵	08.436 ³³³	46.38 ²²⁶
Aug. 8.2	42.770 ²⁶⁷	69.78 ¹⁸⁹	14.798 ³⁴⁰	22.50 ²⁸	08.769 ³⁰⁶	48.64 ²³⁷
18.1	43.037 ²³⁷	71.67 ¹⁷⁸	15.138 ³⁰²	22.78 ⁷⁸	09.075 ²⁷²	51.01 ²⁴²
28.1	43.274 ²⁰⁴	73.45 ¹⁶³	15.440 ²⁵⁵	23.56 ¹²⁶	09.347 ²³⁷	53.43 ²⁴³
Sept. 7.1	43.478 ¹⁷⁰	75.08 ¹⁴⁴	15.695 ²⁰⁵	24.82 ¹⁶⁸	09.584 ¹⁹⁸	55.86 ²³⁹
17.1	43.648 ¹³³	76.52 ¹²⁵	15.900 ¹⁵¹	26.50 ²⁰⁴	09.782 ¹⁵⁸	58.25 ²³⁰
27.0	43.781 ¹⁰⁰	77.77 ¹⁰⁵	16.051 ⁹⁵	28.54 ²³¹	09.940 ¹¹⁹	60.55 ²¹⁸
Oct. 7.0	43.881 ⁶⁷	78.82 ⁸³	16.146 ⁴¹	30.85 ²⁴⁹	10.059 ⁸¹	62.73 ²⁰²
16.9	43.948 ³⁵	79.65 ⁶¹	16.187 ¹²	33.34 ²⁵⁸	10.140 ⁴⁴	64.75 ¹⁸³
26.9	43.983 ⁶	80.26 ⁴³	16.175 ⁶⁰	35.92 ²⁵³	10.184 ¹⁰	66.58 ¹⁶¹
Nov. 5.9	43.989 ¹⁹	80.69 ²²	16.115 ¹⁰⁴	38.45 ²⁴⁰	10.194 ²³	68.19 ¹³⁶
15.9	43.970 ⁴³	80.91 ⁴	16.011 ¹⁴³	40.85 ²¹⁸	10.171 ⁵³	69.55 ¹⁰⁸
25.9	43.927 ⁶⁴	80.95 ¹³	15.868 ¹⁷³	43.03 ¹⁸⁷	10.118 ⁸¹	70.63 ⁷⁸
Dec. 5.8	43.863 ⁸³	80.82 ²⁹	15.695 ¹⁹⁸	44.90 ¹⁴⁸	10.037 ¹⁰⁶	71.41 ⁴⁷
15.8	43.780 ⁹⁷	80.53 ⁴⁴	15.497 ²¹⁶	46.38 ¹⁰³	09.931 ¹²⁷	71.88 ¹³
25.8	43.683 ¹¹⁰	80.09 ⁵⁸	15.281 ²²⁶	47.41 ⁵⁶	09.804 ¹⁴³	72.01 ²¹
35.8	43.573	79.51	15.055	47.97	09.661	71.80
Mean Place	39.236	49.57	11.192	58.34	05.071	35.25
Secδ, Tanδ	1.033	+ 0.260	1.468	- 1.075	1.225	+ 0.707
<i>a</i> , <i>a'</i>	+3.2	+19.3	+2.7	+19.3	+3.3	+19.2
<i>b</i> , <i>b'</i>	+0.02	- 0.3	-0.07	- 0.3	+0.05	- 0.3
Authority and Catalogue No.	N.A.	61	B.J.	63	B.J.	69

† First transit, Oct. 7

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ζ Piscium			θ Ceti			δ Cassiopeiae		
	5.57		A5	3.83		Ko	2.80		A5
	Mean Solar Date			R.A.		Dec.	R.A.		Dec.
	h I	m 10	s + 7 13	h I	m 20	s - 8 30	h I	m 21	s + 59 53
Jan. 0.8	21.013		63.99	47.604		62.77	33.862		77.37
10.8	20.904	109	63.34	47.492	112	63.48	33.562	300	77.61
20.7	20.790	114	62.67	47.372	120	64.04	33.245	317	77.33
30.7	20.674	116	62.01	47.250	122	64.42	32.925	320	76.53
Feb. 9.7	20.563	111	61.38	47.132	118	64.60	32.616	309	75.25
19.6	20.464	99	60.82	47.023	109	64.57	32.335	281	73.55
Mar. 1.6	20.381	83	60.35	46.931	92	64.32	32.096	239	71.50
11.6	20.324	57	60.03	46.862	69	63.84	31.913	183	69.19
21.6	20.298	26	59.86	46.823	39	63.12	31.799	114	66.72
31.5	20.311	13	59.90	46.819	4	62.16	31.763	36	64.19
Apr. 10.5	20.364	53	60.18	46.854	35	60.96	31.810	47	61.71
20.5	20.459	95	60.69	46.932	78	59.52	31.943	133	59.39
30.5	20.597	138	61.46	47.053	121	57.88	32.160	217	57.31
May 10.4	20.778	181	62.49	47.216	163	56.04	32.457	297	55.56
20.4	20.998	220	63.76	47.419	203	54.05	32.827	370	54.19
30.4	21.252	254	65.23	47.658	239	51.95	33.258	431	53.25
June 9.3	21.535	283	66.91	47.928	270	49.79	33.740	482	52.78
19.3	21.838	303	68.71	48.220	292	47.61	34.259	519	52.79
29.3	22.154	316	70.63	48.528	308	45.46	34.800	541	53.27
July 9.3	22.475	321	72.57	48.843	315	43.43	35.351	551	54.22
19.2	22.793	318	74.52	49.159	316	41.55	35.899	548	55.61
29.2	23.100	307	76.42	49.466	307	39.87	36.431	532	57.41
Aug. 8.2	23.391	291	78.22	49.758	292	38.44	36.936	505	59.57
18.2	23.657	266	79.85	50.029	271	37.29	37.404	468	62.05
28.1	23.897	240	81.35	50.273	244	36.44	37.828	424	64.78
Sept. 7.1	24.105	208	82.62	50.487	214	35.91	38.201	373	67.71
17.1	24.277	172	83.67	50.667	180	35.70	38.519	318	70.79
27.0	24.418	141	84.48	50.813	146	35.79	38.778	259	73.95
Oct. 7.0	24.523	105	85.08	50.925	112	36.16	38.976	198	77.13
16.9	24.595	72	85.43	51.003	78	36.77	39.113	137	80.26
26.9	24.638	43	85.59	51.048	45	37.58	39.188	75	83.29
Nov. 5.9	24.652	14	85.56	51.064	16	38.53	39.202	14	86.14
15.9	24.639	13	85.39	51.052	12	39.58	39.156	46	88.76
25.9	24.604	35	85.05	51.015	37	40.67	39.052	104	91.07
Dec. 5.9	24.546	58	84.62	50.956	59	41.76	38.894	158	93.01
15.8	24.471	75	84.09	50.877	79	42.79	38.686	208	94.53
25.8	24.378	93	83.49	50.782	95	43.73	38.434	252	95.59
35.8	24.273	105	82.83	50.673	109	44.56	38.148	286	96.13
Mean Place	19.920		55.85	46.407		65.51	32.651		53.69
Sec δ , Tan δ	1.008		+ 0.127	1.011		- 0.150	1.994		+ 1.725
α , α'	+3.1		+19.1	+3.0		+18.8	+3.9		+18.8
δ , δ'	+0.01		- 0.3	-0.01		- 0.3	+0.11		- 0.3
Authority and Catalogue No.	A.E.		74	B.J.		81	B.J.		83

APPARENT PLACES OF STARS, 1935

367

AT UPPER TRANSIT AT GREENWICH

Name	γ Phoenicis		η Piscium		α Eridani (<i>Achernar</i>)	
	3.40	K5	3.72	G5	0.60	B5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h I 25	^m -43 38	^h I 28	^m +15 00	^h I 35	^m -57 33
Jan. 0.8	34.112	69.94	01.240	51.87	19.524	69.35
10.8	33.904	70.48	01.130	51.32	19.198	69.80
20.7	33.691	70.53	01.009	50.67	18.865	69.68
30.7	33.479	70.10	00.884	49.94	18.535	69.01
Feb. 9.7	33.276	69.20	00.760	49.17	18.218	67.80
19.6	33.090	67.85	00.645	48.38	17.925	66.09
Mar. 1.6	32.928	66.09	00.547	47.62	17.664	63.91
11.6	32.798	63.95	00.472	46.93	17.446	61.34
21.6	32.706	61.48	00.429	46.36	17.279	58.42
31.5	32.659	58.73	00.423	45.94	17.170	55.22
Apr. 10.5	32.661	55.75	00.459	45.73	17.125	51.81
20.5	32.716	52.62	00.540	45.74	17.148	48.27
30.5	32.825	49.39	00.667	46.01	17.241	44.66
May 10.4	32.989	46.13	00.838	46.55	17.405	41.08
20.4	33.204	42.91	01.051	47.36	17.636	37.59
30.4	33.466	39.80	01.301	48.43	17.930	34.27
June 9.3	33.769	36.88	01.581	49.73	18.281	31.21
19.3	34.105	34.22	01.885	51.24	18.678	28.48
29.3	34.467	31.88	02.205	52.92	19.112	26.13
July 9.3	34.843	29.93	02.532	54.72	19.571	24.24
19.2	35.225	28.42	02.859	56.60	20.043	22.86
29.2	35.602	27.38	03.177	58.51	20.514	22.03
Aug. 8.2	35.964	26.84	03.480	60.39	20.972	21.77
18.2	36.302	26.83	03.762	62.21	21.404	22.07
28.1	36.608	27.33	04.018	63.91	21.798	22.94
Sept. 7.1	36.874	28.32	04.244	65.48	22.143	24.34
17.1	37.096	29.76	04.439	66.88	22.431	26.22
27.0	37.269	31.60	04.600	68.09	22.655	28.51
Oct. 7.0	37.392	33.76	04.728	69.10	22.811	31.13
16.9	37.464	36.14	04.823	69.92	22.897	33.97
26.9	37.487	38.66	04.886	70.53	22.913	36.93
Nov. 5.9	37.463	41.22	04.920	70.95	22.861	39.88
15.9	37.396	43.70	04.926	71.19	22.745	42.71
25.9	37.291	46.00	04.906	71.26	22.572	45.30
Dec. 5.9	37.152	48.04	04.861	71.17	22.350	47.56
15.8	36.985	49.75	04.794	70.93	22.086	49.40
25.8	36.797	51.05	04.706	70.56	21.789	50.75
35.8	36.592	51.90	04.602	70.05	21.469	51.57
Mean Place	32.671	62.29	00.047	40.92	17.783	59.14
Socd, Tan δ	1.382	-0.954	1.035	+0.268	1.865	-1.574
a, a'	+2.6	+18.7	+3.2	+18.6	+2.2	+18.3
b, b'	-0.06	-0.4	+0.02	-0.4	-0.10	-0.4
Authority and Catalogue No.	A.N.	85	B.J.	88	B.J.	96

† Second transit, Oct. 16

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	♈ Piscium		♏ Piscium		♐ Ceti	
	4.68	Ko	4.50	Ko	3.92	Ko
	Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h I 38 ^m	+ 5 09	^h I 41 ^m	+ 8 49	^h I 48 ^m	- 10 38
Jan. 0.8	03.986 ¹⁰⁴	41.61 ⁶⁵	58.745 ¹⁰⁴	62.06 ⁶⁰	16.388 ¹¹¹	77.13 ⁸¹
10.8	03.882 ¹¹⁷	40.96 ⁶⁴	58.641 ¹¹⁷	61.46 ⁶³	16.277 ¹²⁴	77.94 ⁶³
20.7	03.765 ¹²²	40.32 ⁶⁰	58.524 ¹²⁴	60.83 ⁶⁴	16.153 ¹³¹	78.57 ⁴²
30.7	03.643 ¹²²	39.72 ⁵⁵	58.400 ¹²⁵	60.19 ⁶²	16.022 ¹³²	78.99 ²⁰
Feb. 9.7	03.521 ¹¹⁵	39.17 ⁴⁶	58.275 ¹¹⁹	59.57 ⁵⁷	15.890 ¹²⁶	79.19 ⁴
19.7	03.406 ¹⁰¹	38.71 ³⁵	58.156 ¹⁰⁵	59.00 ⁴⁹	15.764 ¹¹⁴	79.15 ²⁸
Mar. 1.6	03.305 ⁸⁰	38.36 ²¹	58.051 ⁸³	58.51 ³⁸	15.650 ⁹³	78.87 ⁵³
11.6	03.225 ⁵²	38.15 ¹⁵	57.968 ⁵⁵	58.13 ²⁴	15.557 ⁶⁶	78.34 ⁷⁸
21.6	03.173 ¹⁶	38.11 ³⁶	57.913 ¹⁹	57.89 ⁶	15.491 ³³	77.56 ¹⁰⁴
31.5	03.157 ²³	38.26 ⁶⁰	57.894 ²⁰	57.83 ¹⁴	15.458 ⁷	76.52 ¹²⁸
Apr. 10.5	03.180 ⁶⁶	38.62 ⁸⁴	57.914 ⁶⁴	57.97 ³⁷	15.465 ⁴⁸	75.24 ¹⁵¹
20.5	03.246 ¹¹¹	39.22 ¹⁰⁷	57.978 ¹⁰⁹	58.34 ⁶¹	15.513 ⁹³	73.73 ¹⁷³
30.5	03.357 ¹⁵⁴	40.06 ¹³⁰	58.087 ¹⁵⁴	58.95 ⁸⁵	15.606 ¹³⁷	72.00 ¹⁹¹
May 10.4	03.511 ¹⁹⁶	41.13 ¹⁴⁹	58.241 ¹⁹⁶	59.80 ¹⁰⁹	15.743 ¹⁷⁹	70.09 ²⁰⁷
20.4	03.707 ²³³	42.43 ¹⁶⁶	58.437 ²³³	60.89 ¹³¹	15.922 ²¹⁷	68.02 ²¹⁷
30.4	03.940 ²⁶⁴	43.92 ¹⁷⁹	58.670 ²⁶⁵	62.20 ¹⁵⁰	16.139 ²⁵²	65.85 ²²⁴
June 9.4	04.204 ²⁸⁹	45.58 ¹⁸⁷	58.935 ²⁹¹	63.70 ¹⁶⁶	16.391 ²⁷⁸	63.61 ²²⁴
19.3	04.493 ³⁰⁶	47.37 ¹⁹⁰	59.226 ³⁰⁷	65.36 ¹⁷⁹	16.669 ²⁹⁹	61.37 ²²⁰
29.3	04.799 ³¹⁶	49.24 ¹⁸⁹	59.533 ³¹⁹	67.15 ¹⁸⁴	16.968 ³¹⁰	59.17 ²⁰⁸
July 9.3	05.115 ³¹⁸	51.14 ¹⁸²	59.852 ³²⁰	68.99 ¹⁸⁶	17.278 ³¹⁵	57.09 ¹⁹¹
19.2	05.433 ³¹²	53.03 ¹⁷¹	60.172 ³¹⁵	70.85 ¹⁸³	17.593 ³¹²	55.18 ¹⁷⁰
29.2	05.745 ²⁹⁸	54.85 ¹⁵⁵	60.487 ³⁰²	72.68 ¹⁷⁶	17.905 ³⁰¹	53.48 ¹⁴³
Aug. 8.2	06.043 ²⁸⁰	56.56 ¹³⁵	60.789 ²⁸⁴	74.44 ¹⁶²	18.206 ²⁸³	52.05 ¹¹⁴
18.2	06.323 ²⁵⁵	58.11 ¹¹⁴	61.073 ²⁶⁰	76.06 ¹⁴⁷	18.489 ²⁶²	50.91 ⁸¹
28.1	06.578 ²²⁷	59.46 ⁹⁰	61.333 ²³²	77.53 ¹²⁸	18.751 ²³⁴	50.10 ⁴⁷
Sept. 7.1	06.805 ¹⁹⁷	60.60 ⁶⁶	61.565 ²⁰²	78.81 ¹⁰⁷	18.985 ²⁰³	49.63 ¹²
17.1	07.002 ¹⁶⁵	61.50 ⁴²	61.767 ¹⁷¹	79.88 ⁸⁵	19.188 ¹⁷²	49.51 ²⁰
27.1	07.167 ¹³³	62.16 ²⁰	61.938 ¹³⁸	80.73 ⁶³	19.360 ¹³⁸	49.71 ⁵⁰
Oct. 7.0	07.300 ¹⁰⁰	62.58 ¹	62.076 ¹⁰⁶	81.36 ⁴¹	19.498 ¹⁰⁵	50.21 ⁷⁶
17.0	07.400 ⁷⁰	62.78 ¹⁷	62.182 ⁷⁶	81.77 ²¹	19.603 ⁷²	50.97 ⁹⁸
26.9	07.470 ⁴⁰	62.77 ¹⁹	62.258 ⁴⁶	81.98 ³	19.675 ⁴¹	51.95 ¹¹³
Nov. 5.9	07.510 ¹²	62.58 ³⁴	62.304 ¹⁸	82.01 ¹³	19.716 ¹²	53.08 ¹²⁴
15.9	07.522 ¹⁴	62.24 ⁴⁶	62.322 ⁹	81.88 ²⁷	19.728 ¹⁶	54.32 ¹²⁸
25.9	07.508 ³⁹	61.78 ⁶²	62.313 ³⁴	81.61 ⁴⁷	19.712 ⁴²	55.60 ¹²⁶
Dec. 5.9	07.469 ⁶¹	61.23 ⁶⁵	62.279 ⁵⁸	81.23 ⁵⁵	19.670 ⁶⁶	56.86 ¹²⁰
15.8	07.408 ⁸¹	60.61 ⁷⁹	62.221 ⁷⁹	80.76 ⁶⁰	19.604 ⁸⁶	58.06 ¹⁰⁹
25.8	07.327 ⁹⁸	59.96 ⁶⁸	62.142 ⁹⁷	80.21 ⁶⁰	19.518 ¹⁰⁵	59.15 ⁹⁵
35.8	07.229	59.28	62.045	79.61	19.413	60.10
Mean Place	02.723	34.01	57.460	53.18	15.034	79.46
Secδ, Tanδ	1.004	+ 0.090	1.012	+ 0.155	1.018	- 0.188
a, α	+3.1	+18.2	+3.2	+18.1	+3.0	+17.9
b, β	+0.01	- 0.4	+0.01	- 0.4	-0.01	- 0.5
Authority and Catalogue No.	A.N.	99	B.J.	104	B.J.	109
† Second transit, Oct. 16		† First transit, Oct. 17				

APPARENT PLACES OF STARS, 1935

369

AT UPPER TRANSIT AT GREENWICH

Name	α Trianguli		ϵ Cassiopeiæ		β Arietis	
Mag. Spect.	3.58	F5	3.44	B3	2.72	A5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h I 49	^m +29 15	^h I 49	^m +63 21	^h I 51	^m +20 29
Jan. 0.8	23.496 ¹²³	62.22 ²²	43.40 ³³	27.49 ⁶⁶	03.983 ¹¹⁰	40.70 ³⁹
10.8	23.373 ¹⁴⁰	62.00 ⁴⁷	43.07 ³⁶	28.15 ¹²	03.873 ¹²⁵	40.31 ⁵⁴
20.7	23.233 ¹⁵⁰	61.53 ⁶⁹	42.71 ³⁷	28.27 ⁴²	03.748 ¹³⁵	39.77 ⁶⁸
30.7	23.083 ¹⁵³	60.84 ⁹⁰	42.34 ³⁸	27.85 ⁹⁴	03.613 ¹³⁷	39.09 ⁷⁹
Feb. 9.7	22.930 ¹⁴⁶	59.94 ¹⁰⁵	41.96 ³⁵	26.91 ¹⁴¹	03.476 ¹³²	38.30 ⁸⁶
19.7	22.784 ¹³⁰	58.89 ¹¹⁸	41.61 ³¹	25.50 ¹⁸²	03.344 ¹¹⁹	37.44 ⁸⁹
Mar. 1.6	22.654 ¹⁰⁵	57.71 ¹²⁴	41.30 ²⁶	23.68 ²¹⁶	03.225 ⁹⁷	36.55 ⁸⁹
11.6	22.549 ⁷²	56.47 ¹²⁴	41.04 ¹⁸	21.52 ²⁴⁰	03.128 ⁶⁶	35.66 ⁸²
21.6	22.477 ³¹	55.23 ¹¹⁷	40.86 ¹¹	19.12 ²⁵³	03.062 ²⁹	34.84 ⁷¹
31.6	22.446 ¹⁵	54.06 ¹⁰⁵	40.75 ¹	16.59 ²⁵⁷	03.033 ¹⁴	34.13 ⁵⁵
Apr. 10.5	22.461 ⁶⁵	53.01 ⁸⁶	40.74 ⁸	14.02 ²⁴⁸	03.047 ⁶⁰	33.58 ³⁵
20.5	22.526 ¹¹⁷	52.15 ⁶⁴	40.82 ¹⁸	11.54 ²³²	03.107 ¹⁰⁸	33.23 ¹²
30.5	22.643 ¹⁶⁷	51.51 ³⁶	41.00 ²⁷	09.22 ²⁰⁶	03.215 ¹⁵⁵	33.11 ¹⁴
May 10.4	22.810 ²¹⁴	51.15 ⁶	41.27 ³⁶	07.16 ¹⁷³	03.370 ²⁰⁰	33.25 ⁴²
20.4	23.024 ²⁵⁸	51.09 ²⁵	41.63 ⁴⁴	05.43 ¹³⁴	03.570 ²⁴¹	33.67 ⁶⁹
30.4	23.282 ²⁹³	51.34 ⁵⁶	42.07 ⁴⁹	04.09 ⁹¹	03.811 ²⁷⁴	34.36 ⁹⁶
June 9.4	23.575 ³²¹	51.90 ⁸⁶	42.56 ⁵⁵	03.18 ⁴⁴	04.085 ³⁰²	35.32 ¹¹⁹
19.3	23.896 ³⁴¹	52.76 ¹¹³	43.11 ⁵⁸	02.74 ³	04.387 ³²³	36.51 ¹⁴¹
29.3	24.237 ³⁵³	53.89 ¹³⁹	43.69 ⁶¹	02.77 ⁵⁰	04.710 ³³³	37.92 ¹⁵⁸
July 9.3	24.590 ³⁵⁶	55.28 ¹⁶⁰	44.30 ⁶¹	03.27 ⁹⁵	05.043 ³³⁶	39.50 ¹⁷⁰
19.3	24.946 ³⁵⁰	56.88 ¹⁷⁶	44.91 ⁶⁰	04.22 ¹³⁹	05.379 ³³¹	41.20 ¹⁷⁹
29.2	25.296 ³³⁷	58.64 ¹⁸⁸	45.51 ⁵⁸	05.61 ¹⁷⁹	05.710 ³¹⁹	42.99 ¹⁸³
Aug. 8.2	25.633 ³¹⁸	60.52 ¹⁹⁶	46.09 ⁵⁵	07.40 ²¹⁴	06.029 ³⁰¹	44.82 ¹⁸²
18.2	25.951 ²⁹³	62.48 ¹⁹⁹	46.64 ⁵¹	09.54 ²⁴⁵	06.330 ²⁷⁸	46.64 ¹⁷⁷
28.1	26.244 ²⁶⁴	64.47 ¹⁹⁸	47.15 ⁴⁶	11.99 ²⁷¹	06.608 ²⁵⁰	48.41 ¹⁶⁸
Sept. 7.1	26.508 ²³³	66.45 ¹⁹²	47.61 ⁴⁰	14.70 ²⁹¹	06.858 ²²⁰	50.09 ¹⁵⁶
17.1	26.741 ¹⁹⁸	68.37 ¹⁸⁴	48.01 ³⁵	17.61 ³⁰⁶	07.078 ¹⁸⁹	51.65 ¹⁴²
27.1	26.939 ¹⁶⁵	70.21 ¹⁷³	48.36 ²⁸	20.67 ³¹⁵	07.267 ¹⁵⁶	53.07 ¹²⁶
Oct. 7.0	27.104 ¹³⁰	71.94 ¹⁵⁹	48.64 ²¹	23.82 ³¹⁶	07.423 ¹²⁴	54.33 ¹⁰⁸
17.0	27.234 ⁹⁵	73.53 ¹⁴³	48.85 ¹⁹	26.98 ³¹²	07.547 ⁹²	55.41 ⁹¹
26.9	27.329 ⁶³	74.96 ¹²⁶	49.00 ⁷	30.10 ³⁰²	07.639 ⁶¹	56.32 ⁷²
Nov. 5.9	27.392 ²⁹	76.22 ¹⁰⁶	49.07 ¹	33.12 ²⁸³	07.700 ³⁰	57.04 ⁵⁵
15.9	27.421 ³	77.28 ⁸⁶	49.08 ⁷	35.95 ²⁵⁹	07.730 ¹	57.59 ³⁷
25.9	27.418 ³³	78.14 ⁶⁴	49.01 ¹³	38.54 ²²⁶	07.731 ²⁷	57.96 ²⁰
Dec. 5.9	27.385 ⁶²	78.78 ⁴⁰	48.88 ²⁰	40.80 ¹⁸⁹	07.704 ⁵⁴	58.16 ²
15.8	27.323 ⁹⁰	79.18 ¹⁶	48.68 ²⁶	42.69 ¹⁴⁵	07.650 ⁷⁸	58.18 ¹⁶
25.8	27.233 ¹¹⁴	79.34 ⁹	48.42 ³¹	44.14 ⁹⁵	07.572 ¹⁰¹	58.02 ³¹
35.8	27.119	79.25	48.11	45.09	07.471	57.71
Mean Place	22.142	46.68	41.684	03.56	02.636	27.95
Secδ, Tanδ	1.146	+ 0.560	2.230	+ 1.993	1.068	+ 0.374
α, α'	+3.4	+17.8	+4.3	+17.8	+3.3	+17.7
δ, δ'	+0.03	- 0.5	+0.12	- 0.5	+0.02	- 0.5
Authority and Catalogue No.	B.J.	110	B.J.	111	B.J.	114

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name Mag. Spect. Mean Solar Date	α Hydri		ν Ceti		γ^1 Andromedæ	
	3.02	Fo	4.18	Ma	2.28	Ko
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	$^h \quad ^m$ 1 56	$^{\circ} \quad ' \quad ''$ -61 52	$^h \quad ^m$ 1 56	$^{\circ} \quad ' \quad ''$ -21 22	$^h \quad ^m$ 1 59	$^{\circ} \quad ' \quad ''$ +42 01
Jan. 0.8	45.37	78.05	57.942	92.10	55.479	26.72
10.8	44.99	78.72	57.815	93.02	55.324	26.90
20.7	44.59	78.82	57.675	93.64	55.147	26.70
30.7	44.18	78.33	57.527	93.95	54.956	26.16
Feb. 9.7	43.78	77.27	57.377	93.92	54.761	25.28
19.7	43.41	75.69	57.233	93.57	54.573	24.10
Mar. 1.6	43.07	73.62	57.101	92.90	54.402	22.68
11.6	42.77	71.12	56.989	91.91	54.260	21.08
21.6	42.52	68.24	56.905	90.61	54.157	19.36
31.6	42.34	65.06	56.855	89.03	54.102	17.62
Apr. 10.5	42.23	61.62	56.844	87.18	54.101	15.95
20.5	42.20	58.04	56.877	85.10	54.159	14.38
30.5	42.24	54.37	56.955	82.82	54.277	13.02
May 10.4	42.37	50.70	57.080	80.39	54.454	11.92
20.4	42.58	47.11	57.249	77.84	54.686	11.12
30.4	42.85	43.68	57.459	75.25	54.969	10.66
June 9.4	43.20	40.48	57.705	72.67	55.294	10.56
19.3	43.61	37.59	57.982	70.15	55.654	10.82
29.3	44.06	35.10	58.283	67.78	56.037	11.45
July 9.3	44.55	33.06	58.597	65.60	56.435	12.41
19.3	45.06	31.53	58.919	63.67	56.840	13.69
29.2	45.58	30.55	59.240	62.06	57.240	15.25
Aug. 8.2	46.10	30.14	59.552	60.79	57.628	17.05
18.2	46.59	30.33	59.848	59.92	57.996	19.05
28.1	47.04	31.11	60.122	59.45	58.339	21.20
Sept. 7.1	47.45	32.45	60.369	59.40	58.650	23.45
17.1	47.80	34.30	60.586	59.75	58.927	25.76
27.1	48.09	36.60	60.768	60.49	59.168	28.08
Oct. 7.0	48.30	39.26	60.915	61.57	59.369	30.39
17.0	48.42	42.19	61.027	62.93	59.531	32.61
26.9	48.47	45.26	61.103	64.51	59.653	34.74
Nov. 5.9	48.44	48.37	61.145	66.24	59.735	36.72
15.9	48.33	51.39	61.154	68.04	59.776	38.52
25.9	48.15	54.19	61.133	69.84	59.778	40.10
Dec. 5.9	47.91	56.68	61.083	71.55	59.742	41.42
15.8	47.62	58.76	61.007	73.11	59.667	42.46
25.8	47.27	60.35	60.908	74.48	59.557	43.17
35.8	46.90	61.40	60.789	75.59	59.416	43.55
Mean Place	43.339	67.82	56.502	91.16	53.966	07.69
Sec δ , Tan δ	2.122	-1.872	1.074	-0.392	1.346	+0.901
a, a'	+1.9	+17.5	+2.8	+17.5	+3.7	+17.4
b, b'	-0.11	-0.5	-0.02	-0.5	+0.05	-0.5
Authority and Catalogue No.	B.J.	119	B.J.	120	B.J.	124

APPARENT PLACES OF STARS, 1935

371

AT UPPER TRANSIT AT GREENWICH

Name	α Arietis		β Trianguli		ζ Ceti	
	2.23	K2	3.08	A5	4.54	G5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 2 ^m 03	[°] +23 ['] 09	^h 2 ^m 05	[°] +34 ['] 40	^h 2 ^m 09	[°] + 8 ['] 32
Jan. 0.8	31.626 ¹⁰⁹	35.06 ²⁹	41.539 ¹²⁹	67.84 ¹	34.503 ¹⁰⁰	42.93 ⁶⁰
10.8	31.517 ¹²⁷	34.77 ⁴⁶	41.410 ¹⁵¹	67.85 ²⁷	34.403 ¹¹⁵	42.33 ⁶⁰
20.8	31.390 ¹³⁹	34.31 ⁶²	41.259 ¹⁶⁴	67.58 ⁵⁵	34.288 ¹²⁸	41.73 ⁵⁹
30.7	31.251 ¹⁴⁴	33.69 ⁷⁶	41.095 ¹⁷⁰	67.03 ⁸¹	34.160 ¹³³	41.14 ⁵⁶
Feb. 9.7	31.107 ¹⁴²	32.93 ⁸⁶	40.925 ¹⁶⁶	66.22 ¹⁰⁵	34.027 ¹³⁰	40.58 ⁵⁵
19.7	30.965 ¹²⁹	32.07 ⁹³	40.759 ¹⁵³	65.17 ¹²²	33.897 ¹²³	40.03 ⁴⁶
Mar. 1.6	30.836 ¹⁰⁹	31.14 ⁹⁵	40.606 ¹²⁸	63.95 ¹³⁴	33.774 ¹⁰³	39.57 ³⁵
11.6	30.727 ⁷⁹	30.19 ⁹²	40.478 ⁹⁴	62.61 ¹⁴⁰	33.671 ⁷⁷	39.22 ²¹
21.6	30.648 ⁴²	29.27 ⁸⁴	40.384 ⁵²	61.21 ¹⁴⁰	33.594 ⁴⁶	39.01 ⁴
31.6	30.606 ²	28.43 ⁷¹	40.332 ⁴	59.81 ¹³²	33.548 ⁵	38.97 ¹⁵
Apr. 10.5	30.608 ⁴⁸	27.72 ⁵²	40.328 ⁵⁰	58.49 ¹¹⁷	33.543 ³⁶	39.12 ³³
20.5	30.656 ⁹⁸	27.20 ³¹	40.378 ¹⁰⁴	57.32 ⁹⁸	33.579 ⁸³	39.45 ⁵⁷
30.5	30.754 ¹⁴⁶	26.89 ⁵	40.482 ¹⁵⁸	56.34 ⁷²	33.662 ¹²⁸	40.02 ⁷⁹
May 10.5	30.900 ¹⁹³	26.84 ²¹	40.640 ²¹⁰	55.62 ⁴⁴	33.790 ¹⁷³	40.81 ¹⁰⁴
20.4	31.093 ²³⁴	27.05 ⁴⁹	40.850 ²⁵⁶	55.18 ¹³	33.963 ²¹⁰	41.85 ¹²³
30.4	31.327 ²⁷²	27.54 ⁷⁶	41.106 ²⁹⁶	55.05 ²⁰	34.173 ²⁴⁶	43.08 ¹⁴²
June 9.4	31.599 ³⁰⁰	28.30 ¹⁰¹	41.402 ³²⁸	55.25 ⁵²	34.419 ²⁷⁶	44.50 ¹⁵⁵
19.3	31.899 ³²⁴	29.31 ¹²⁴	41.730 ³⁵¹	55.77 ⁸³	34.695 ²⁹⁵	46.05 ¹⁶⁶
29.3	32.223 ³³⁵	30.55 ¹⁴³	42.081 ³⁶⁷	56.60 ¹¹¹	34.990 ³¹²	47.71 ¹⁷⁶
July 9.3	32.558 ³⁴¹	31.98 ¹⁵⁹	42.448 ³⁷³	57.71 ¹³⁷	35.302 ³¹⁹	49.47 ¹⁷⁸
19.3	32.899 ³³⁸	33.57 ¹⁷⁰	42.821 ³⁷⁰	59.08 ¹⁵⁹	35.621 ³¹⁶	51.25 ¹⁷³
29.2	33.237 ³²⁸	35.27 ¹⁷⁶	43.191 ³⁶⁰	60.67 ¹⁷⁶	35.937 ³⁰⁷	52.98 ¹⁶⁶
Aug. 8.2	33.565 ³¹²	37.03 ¹⁷⁹	43.551 ³⁴³	62.43 ¹⁸⁹	36.244 ²⁹⁵	54.64 ¹⁵⁶
18.2	33.877 ²⁹⁰	38.82 ¹⁷⁷	43.894 ³¹⁹	64.32 ¹⁹⁹	36.539 ²⁷⁴	56.20 ¹³⁷
28.2	34.167 ²⁶⁴	40.59 ¹⁷¹	44.213 ²⁹²	66.31 ²⁰²	36.813 ²⁵³	57.57 ¹²⁰
Sept. 7.1	34.431 ²³⁵	42.30 ¹⁶¹	44.505 ²⁶¹	68.33 ²⁰³	37.066 ²²³	58.77 ⁹⁹
17.1	34.666 ²⁰⁴	43.91 ¹⁵⁰	44.766 ²²⁷	70.36 ²⁰⁰	37.289 ¹⁹⁶	59.76 ⁷⁸
27.1	34.870 ¹⁷³	45.41 ¹³⁶	44.993 ¹⁹²	72.36 ¹⁹³	37.485 ¹⁶⁴	60.54 ⁵⁵
Oct. 7.0	35.043 ¹⁴⁰	46.77 ¹²⁰	45.185 ¹⁵⁷	74.29 ¹⁸³	37.649 ¹³⁴	61.09 ³⁵
17.0	35.183 ¹⁰⁸	47.97 ¹⁰⁴	45.342 ¹²¹	76.12 ¹⁷¹	37.783 ¹⁰⁴	61.44 ¹²
26.9	35.291 ⁷⁶	49.01 ⁸⁶	45.463 ⁸⁶	77.83 ¹⁵⁶	37.887 ⁷³	61.56 ⁴
Nov. 5.9	35.367 ⁴⁴	49.87 ⁷⁰	45.549 ⁴⁹	79.39 ¹³⁸	37.960 ⁴⁴	61.52 ¹⁹
15.9	35.411 ¹⁴	50.57 ⁵²	45.598 ¹⁴	80.77 ¹¹⁸	38.004 ¹⁷	61.33 ³²
25.9	35.425 ¹⁷	51.09 ³⁴	45.612 ²¹	81.95 ⁹⁷	38.021 ¹⁵	61.01 ⁴⁴
Dec. 5.9	35.408 ⁴⁵	51.43 ¹⁶	45.591 ⁵⁵	82.92 ⁷²	38.006 ³⁷	60.57 ⁵⁰
15.9	35.363 ⁷³	51.59 ²	45.536 ⁸⁷	83.64 ⁴⁵	37.969 ⁶⁶	60.07 ⁵⁵
25.8	35.290 ⁹⁸	51.57 ²⁰	45.449 ¹¹⁶	84.09 ¹⁷	37.903 ⁸⁷	59.52 ⁶⁰
35.8	35.192	51.37	45.333	84.26	37.816	58.92
Mean Place	30.188	21.55	40.030	50.91	33.054	34.16
Sec δ , Tan δ	1.088	+ 0.428	1.216	+ 0.692	1.011	+ 0.150
a, a'	+3.4	+17.2	+3.6	+17.1	+3.2	+16.9
b, b'	+0.02	- 0.5	+0.04	- 0.5	+0.01	- 0.5
Authority and Catalogue No.	B.J.	125	B.J.	126	A.E.	130

TRANSIT AT GREENWICH									
Name		67 Ceti		φ Eridani		θ Arietis			
Mag.	Spect.	5.70	G5	3.78	B8	5.69	Ao		
Mean Solar Date		R.A.	Dec.	R.A.	Dec.	R.A.	Dec.		
		^h 2 ^m 13	— 6° 42'	^h 2 ^m 14	— 51° 48'	^h 2 ^m 14	+ 19° 36'		
Jan.	0.8	45.850	70.96	13.097	52.50	31.765	17.53		
	10.8	45.748	71.83	12.835	53.53	31.664	17.19		
	20.8	45.629	72.54	12.555	54.03	31.543	16.73		
	30.7	45.498	73.08	12.265	53.98	31.408	16.15		
Feb.	9.7	45.361	73.44	11.974	53.40	31.266	15.48		
	19.7	45.226	73.59	11.693	52.30	31.125	14.74		
Mar.	1.7	45.099	73.53	11.431	50.71	30.993	14.74		
	11.6	44.988	73.24	11.198	48.67	30.880	13.96		
	21.6	44.903	72.72	11.004	46.24	30.794	13.18		
	31.6	44.849	71.96	10.856	43.46	30.743	12.45		
Apr.	10.5	44.832	70.95	10.762	40.40	30.733	11.82		
	20.5	44.857	69.72	10.727	37.12	30.769	11.32		
	30.5	44.927	68.26	10.755	33.70	30.852	10.99		
May	10.5	45.041	66.61	10.847	30.20	30.983	10.88		
	20.4	45.199	64.77	11.003	26.71	31.161	11.01		
	30.4	45.397	62.80	11.219	23.31	31.381	11.38		
June	9.4	45.631	60.74	11.490	20.07	31.638	12.01		
	19.4	45.894	58.63	11.809	17.07	31.925	12.88		
	29.3	46.181	56.53	12.168	14.38	32.236	13.97		
July	9.3	46.484	54.50	12.558	12.09	32.562	15.27		
	19.3	46.794	52.58	12.968	10.25	32.894	16.73		
	29.2	47.105	50.84	13.386	08.91	33.225	18.31		
Aug.	8.2	47.409	49.32	13.802	08.11	33.549	19.97		
	18.2	47.700	48.07	14.205	07.88	33.859	21.66		
	28.2	47.973	47.11	14.583	08.22	34.149	23.35		
Sept.	7.1	48.222	46.46	14.927	09.13	34.415	24.98		
	17.1	48.444	46.14	15.230	10.57	34.653	26.52		
	27.1	48.637	46.14	15.485	12.48	34.863	27.95		
Oct.	7.1	48.800	46.43	15.685	14.80	35.042	29.24		
	17.0	48.931	47.00	15.828	17.44	35.189	30.37		
	26.9	49.031	47.80	15.912	20.29	35.306	31.34		
Nov.	5.9	49.100	48.77	15.938	23.24	35.391	31.34		
	15.9	49.140	49.87	15.907	26.19	35.446	32.14		
	25.9	49.150	51.04	15.822	29.01	35.470	32.77		
Dec.	5.9	49.131	52.23	15.688	31.59	35.463	33.24		
	15.9	49.087	53.39	15.508	33.84	35.428	33.55		
	25.8	49.017	54.48	15.291	35.68	35.364	33.71		
	35.8	48.924	55.45	15.042	37.05	35.275	33.72		
Mean Place		44.371	74.78	11.233	44.44	30.266	05.25		
Secd, Tan δ		1.007	— 0.118	1.617	— 1.271	1.062	+ 0.356		
a, a'		+3.0	+16.7	+2.1	+16.7	+3.3	+16.7		
b, b'		— 0.01	— 0.6	— 0.07	— 0.6	+ 0.02	— 0.6		
Authority and Catalogue No.		B.J.	I33	A.N.	I34	A.N.	I35		
† Second transit, Oct. 26									

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

373

Name Mag. Spect.	α Ceti (<i>Mira</i>)		κ Fornacis		δ Hydri	
	Var.	Md	5.37	F5	4.26	A2
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
Mean Solar Date	^h 2 ^m 16	— 3 ^m 15	^h 2 ^m 19	— 24 ^m 06	^h 2 ^m 20	— 68 ^m 56
Jan. 0.8	05.087 ¹⁰⁰	73.43 ⁸²	35.597 ¹²⁸	40.77 ¹⁰⁹	37.79	87.68
10.8	04.987 ¹¹⁷	74.25 ⁷⁰	35.469 ¹⁴⁶	41.86 ⁷⁷	37.25 ⁵⁴	88.58 ⁹⁰
20.8	04.870 ¹³⁰	74.95 ⁵⁹	35.323 ¹⁵⁷	42.63 ⁴³	36.68 ⁵⁷	88.90 ³²
30.7	04.740 ¹³⁵	75.54 ⁴²	35.166 ¹⁶³	43.06 ⁷	36.10 ⁵⁸	88.62 ²⁸
Feb. 9.7	04.605 ¹³⁵	75.96 ²⁵	35.003 ¹⁶¹	43.13 ²⁹	35.52 ⁵⁸	88.62 ⁸⁸
19.7	04.470 ¹²⁶	76.21 ⁷	34.842 ¹⁵²	42.84 ⁶⁵	34.96 ⁵⁶	87.74 ¹⁴³
Mar. 1.7	04.344 ¹¹⁰	76.28 ¹⁵	34.690 ¹³⁵	42.19 ⁹⁹	34.44 ⁵²	86.31 ¹⁹⁶
11.6	04.234 ⁸⁷	76.13 ³⁴	34.555 ¹⁰⁹	41.20 ¹³²	33.97 ⁴⁷	84.35 ²⁴¹
21.6	04.147 ⁵⁴	75.79 ⁵⁷	34.446 ⁷⁶	39.88 ¹⁶²	33.56 ⁴¹	81.94 ²⁸⁰
31.6	04.093 ¹⁷	75.22 ⁸⁰	34.370 ³⁸	38.26 ¹⁹¹	33.24 ³²	79.14 ³¹⁵
Apr. 10.5	04.076 ²⁵	74.42 ¹⁰³	34.332 ⁶	36.35 ²¹⁶	33.00 ¹⁴	75.99 ³⁴¹
20.5	04.101 ⁶⁸	73.39 ¹²⁵	34.338 ⁵²	34.19 ²³⁶	32.86 ¹⁴	72.58 ³⁶⁰
30.5	04.169 ¹¹⁶	72.14 ¹⁴⁴	34.390 ⁹⁹	31.83 ²⁵³	32.82 ⁴	68.98 ³⁷⁰
May 10.5	04.285 ¹⁵⁷	70.70 ¹⁶⁵	34.489 ¹⁴⁵	29.30 ²⁶⁴	32.88 ⁶	65.28 ³⁷³
20.4	04.442 ¹⁹⁸	69.05 ¹⁸⁰	34.634 ¹⁹⁰	26.66 ²⁶⁹	33.05 ¹⁷	61.55 ³⁶⁸
30.4	04.640 ²³⁴	67.25 ¹⁹¹	34.824 ²²⁹	23.97 ²⁶⁹	33.31 ²⁶	57.87 ³⁵³
June 9.4	04.874 ²⁶⁴	65.34 ¹⁹⁸	35.053 ²⁶²	21.28 ²⁶²	33.67 ³⁶	54.34 ³³²
19.4	05.138 ²⁸⁵	63.36 ²⁰⁰	35.315 ²⁸⁹	18.66 ²⁴⁸	33.67 ⁴⁴	51.02 ³⁰⁰
29.3	05.423 ³⁰¹	61.36 ¹⁹⁷	35.604 ³⁰⁸	16.18 ²²⁷	34.11 ⁵¹	48.02 ²⁶⁵
July 9.3	05.724 ³¹¹	59.39 ¹⁸⁸	35.912 ³²⁰	13.91 ²⁰¹	34.62 ⁵⁸	45.37 ²¹⁶
19.3	06.035 ³¹¹	57.51 ¹⁷⁴	36.232 ³²³	11.90 ¹⁶⁹	35.20 ⁶¹	43.21 ¹⁶⁷
29.2	06.346 ³⁰⁵	55.77 ¹⁵⁵	36.555 ³¹⁹	10.21 ¹³¹	35.81 ⁶⁴	41.54 ¹¹¹
Aug. 8.2	06.651 ²⁹¹	54.22 ¹³²	36.874 ³⁰⁶	08.90 ⁹¹	36.45 ⁶⁴	40.43 ⁵⁴
18.2	06.942 ²⁷³	52.90 ¹⁰⁶	37.180 ²⁸⁹	07.99 ⁴⁷	37.09 ⁶³	39.89 ⁸
28.2	07.215 ²⁵¹	51.84 ⁷⁷	37.469 ²⁶⁴	07.52 ³	37.72 ⁶⁰	39.97 ⁶⁷
Sept. 7.1	07.466 ²²⁴	51.07 ⁴⁶	37.733 ²³⁶	07.49 ⁴⁰	38.32 ⁵⁴	40.64 ¹²⁹
17.1	07.690 ¹⁹⁵	50.61 ¹⁷	37.969 ²⁰⁴	07.89 ⁸¹	38.86 ⁴⁸	41.93 ¹⁸¹
27.1	07.885 ¹⁶⁴	50.44 ¹¹	38.173 ¹⁷⁰	08.70 ¹¹⁹	39.34 ⁴⁰	43.74 ²³²
Oct. 7.1	08.049 ¹³⁴	50.55 ³⁹	38.343 ¹³⁵	09.89 ¹⁵⁰	39.74 ³¹	46.06 ²⁶⁹
17.0	08.183 ¹⁰⁵	50.94 ⁵⁹	38.478 ⁹⁹	11.39 ¹⁷⁶	40.05 ²⁰	48.75 ²⁹⁹
27.0	08.288 ⁷²	51.53 ⁷⁸	38.577 ⁶³	13.15 ¹⁹²	40.25 ¹⁰	51.74 ³²⁰
Nov. 5.9	08.360 ⁴⁵	52.31 ⁹¹	38.640 ²⁹	15.07 ²⁰¹	40.35 ¹	54.94 ³²⁵
15.9	08.405 ¹⁴	53.22 ⁹⁹	38.669 ⁴	17.08 ²⁰²	40.34 ¹²	58.19 ³¹⁹
25.9	08.419 ¹⁴	54.21 ¹⁰⁴	38.665 ³⁶	19.10 ¹⁹³	40.22 ²²	61.38 ³⁰¹
Dec. 5.9	08.405 ⁴⁰	55.25 ¹⁰³	38.629 ⁶⁶	21.03 ¹⁷⁹	40.00 ³¹	64.39 ²⁷⁷
15.9	08.365 ⁶⁷	56.28 ⁹⁸	38.563 ⁹⁴	22.82 ¹⁵⁷	39.69 ⁴⁰	67.10 ²³⁰
25.8	08.298 ⁸⁹	57.26 ⁹¹	38.469 ¹¹⁷	24.39 ¹³¹	39.29 ⁴⁶	69.40 ¹⁸⁶
35.8	08.209	58.17	38.352	25.70	38.83 ⁵²	71.26 ¹²⁸
					38.31	72.54
Mean Place	03.599	78.37	34.030	39.40	35.163	77.47
Sec δ , Tan δ	1.002	— 0.057	1.096	— 0.448	2.785	— 2.599
a, a'	+3.0	+16.6	+2.7	+16.4	+1.1	+16.4
b, b'	0.00	— 0.6	— 0.02	— 0.6	— 0.14	— 0.6
Authority and Catalogue No.	A.E.	136	A.N.	137	A.E.	138

† Second transit, Oct. 26

† First transit, Oct. 27

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	♌ Ceti			♍ Ceti			♋ Ceti		
	4.34		Ao	5.04		G5	4.04		B2
	R.A.		Dec.	R.A.		Dec.	R.A.		Dec.
Mean Solar Date	h m 2 24		+ 8 10	h m 2 32		+ 5 18	h m 2 36		+ 0 02
Jan. 0.8	43.484	92	19.70	29.140	90	46.02	10.462	63.15	80
10.8	43.392	113	19.10	29.050	110	45.34	10.372	62.35	71
20.8	43.279	127	18.50	28.940	129	44.72	10.260	61.64	61
30.7	43.152	136	17.92	28.811	136	44.13	10.132	61.03	48
Feb. 9.7	43.016	137	17.36	28.675	139	43.60	09.994	60.55	34
19.7	42.879	130	16.86	28.536	135	43.15	09.853	60.21	19
Mar. 1.7	42.749	115	16.43	28.401	119	42.82	09.717	60.02	1
11.6	42.634	90	16.11	28.282	96	42.60	09.595	60.01	17
21.6	42.544	58	15.92	28.186	66	42.54	09.495	60.18	36
31.6	42.486	21	15.87	28.120	28	42.65	09.425	60.54	58
Apr. 10.6	42.465	22	16.01	28.092	12	42.95	09.391	61.12	80
20.5	42.487	67	16.36	28.104	59	43.45	09.398	61.92	102
30.5	42.554	113	16.92	28.163	101	44.16	09.449	62.94	123
May 10.5	42.667	157	17.70	28.264	149	45.10	09.546	64.17	142
20.4	42.824	199	18.69	28.413	190	46.22	09.687	65.59	159
30.4	43.023	236	19.89	28.603	229	47.56	09.870	67.18	173
June 9.4	43.259	266	21.27	28.832	258	49.03	10.090	68.91	182
19.4	43.525	289	22.80	29.090	284	50.65	10.342	70.73	187
29.3	43.814	307	24.45	29.374	300	52.36	10.620	72.60	188
July 9.3	44.121	315	26.15	29.674	312	54.12	10.916	74.48	182
19.3	44.436	316	27.88	29.986	313	55.86	11.223	76.30	171
29.3	44.752	311	29.57	30.299	309	57.54	11.533	78.01	156
Aug. 8.2	45.063	299	31.18	30.608	300	59.13	11.840	79.57	137
18.2	45.362	282	32.67	30.908	283	60.57	12.137	80.94	113
28.2	45.644	259	34.01	31.191	261	61.82	12.418	82.07	87
Sept. 7.1	45.903	235	35.16	31.452	239	62.85	12.680	82.94	59
17.1	46.138	207	36.09	31.691	210	63.66	12.918	83.53	31
27.1	46.345	179	36.81	31.901	184	64.22	13.130	83.84	4
Oct. 7.1	46.524	149	37.30	32.085	155	64.53	13.314	83.88	22
17.0	46.673	119	37.57	32.240	125	64.62	13.469	83.66	44
27.0	46.792	89	37.65	32.365	95	64.52	13.595	83.22	62
Nov. 5.9	46.881	60	37.55	32.460	65	64.21	13.691	82.60	76
15.9	46.941	30	37.30	32.525	36	63.77	13.757	81.84	87
25.9	46.971	1	36.93	32.561	7	63.21	13.792	80.97	92
Dec. 5.9	46.972	28	36.46	32.568	24	62.58	13.798	80.05	93
15.9	46.944	55	35.93	32.544	52	61.91	13.775	79.12	91
25.8	46.889	81	35.35	32.492	76	61.20	13.724	78.21	87
35.8	46.808		34.74	32.416		60.50	13.646	77.34	
Mean Place	41.949	11.11		27.566	38.37		08.873	57.13	
Secδ, Tanδ	1.010	+ 0.144		1.004	+ 0.093		1.000	+ 0.001	
a, a'	+3.2	+16.2		+3.1	+15.8		+3.1	+15.6	
b, b'	+0.01	- 0.6		0.00	- 0.6		0.00	- 0.6	
Authority and Catalogue No.	B.J.	143		A.E.	150		B.J.	154	

APPARENT PLACES OF STARS, 1935

375

AT UPPER TRANSIT AT GREENWICH

Name	γ^3 Ceti		π Ceti		β Fornacis	
Mag. Spect.	3.69	A2	4.39	B5	4.50	K0
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 2 ^m 39	[°] + 2 ['] 57	^h 2 ^m 41	[°] - 14 ['] 07	^h 2 ^m 46	[°] - 32 ['] 40
Jan. 0.8	57.390 ⁸⁸	53.53 ⁷⁴	03.283 ¹⁰²	57.31 ¹¹⁰	23.897 ¹⁴⁴	43.78 ¹³⁸
10.8	57.302 ¹⁰⁹	52.79 ⁶⁸	03.181 ¹²⁴	58.41 ⁸⁷	23.753 ¹⁶⁸	45.16 ⁹⁹
20.8	57.193 ¹²⁷	52.11 ⁶⁰	03.057 ¹⁴¹	59.28 ⁶²	23.585 ¹⁸⁵	46.15 ⁵⁷
30.8	57.066 ¹³⁸	51.51 ⁵¹	02.916 ¹⁵¹	59.90 ³⁵	23.400 ¹⁹⁵	46.72 ¹³
Feb. 9.7	56.928 ¹⁴²	51.00 ⁴⁰	02.765 ¹⁵³	60.25 ⁷	23.205 ¹⁹⁷	46.85 ²⁹
19.7	56.786 ¹³⁶	50.60 ²⁸	02.612 ¹⁴⁹	60.32 ²¹	23.008 ¹⁹²	46.56 ⁷²
Mar. 1.7	56.650 ¹²⁴	50.32 ¹³	02.463 ¹³⁶	60.11 ⁵⁰	22.816 ¹⁷⁶	45.84 ¹¹²
11.6	56.526 ¹⁰³	50.19 ⁴	02.327 ¹¹⁴	59.61 ⁷⁸	22.640 ¹⁵²	44.72 ¹⁵¹
21.6	56.423 ⁷²	50.23 ²¹	02.213 ⁸⁴	58.83 ¹⁰⁶	22.488 ¹²⁰	43.21 ¹⁸⁶
31.6	56.351 ³⁷	50.44 ⁴¹	02.129 ⁴⁹	57.77 ¹³²	22.368 ⁸²	41.35 ²¹⁸
Apr. 10.6	56.314 ⁴	50.85 ⁶²	02.080 ⁷	56.45 ¹⁵⁸	22.286 ³⁶	39.17 ²⁴⁴
20.5	56.318 ⁴⁹	51.47 ⁸⁴	02.073 ³⁷	54.87 ¹⁸⁰	22.250 ¹²	36.73 ²⁶⁸
30.5	56.367 ⁹⁵	52.31 ¹⁰⁴	02.110 ⁸²	53.07 ²⁰⁰	22.262 ⁶³	34.05 ²⁸⁴
May 10.5	56.462 ¹³⁹	53.35 ¹²⁴	02.192 ¹²⁸	51.07 ²¹⁵	22.325 ¹¹³	31.21 ²⁹⁶
20.5	56.601 ¹⁸¹	54.59 ¹⁴³	02.320 ¹⁷¹	48.92 ²²⁷	22.438 ¹⁶²	28.25 ³⁰¹
30.4	56.782 ²²⁰	56.02 ¹⁵⁷	02.491 ²¹⁰	46.65 ²³⁴	22.600 ²⁰⁶	25.24 ²⁹⁸
June 9.4	57.002 ²⁵¹	57.59 ¹⁶⁹	02.701 ²⁴⁴	44.31 ²³⁵	22.806 ²⁴⁶	22.26 ²⁸⁸
19.4	57.253 ²⁷⁷	59.28 ¹⁷⁶	02.945 ²⁷⁰	41.96 ²²⁹	23.052 ²⁸⁰	19.38 ²⁷²
29.3	57.530 ²⁹⁷	61.04 ¹⁷⁹	03.215 ²⁹¹	39.67 ²¹⁸	23.332 ³⁰⁵	16.66 ²⁴⁷
July 9.3	57.827 ³⁰⁷	62.83 ¹⁷⁵	03.506 ³⁰⁵	37.49 ²⁰¹	23.637 ³²³	14.19 ²¹⁷
19.3	58.134 ³¹¹	64.58 ¹⁶⁸	03.811 ³¹¹	35.48 ¹⁷⁸	23.960 ³³³	12.02 ¹⁷⁸
29.3	58.445 ³⁰⁸	66.26 ¹⁵⁶	04.122 ³⁰⁸	33.70 ¹⁴⁹	24.293 ³³⁵	10.24 ¹³⁶
Aug. 8.2	58.753 ²⁹⁹	67.82 ¹³⁹	04.430 ³⁰⁰	32.21 ¹¹⁷	24.628 ³²⁷	08.88 ⁹⁰
18.2	59.052 ²⁸⁴	69.21 ¹¹⁹	04.730 ²⁸⁶	31.04 ⁸⁰	24.955 ³¹⁴	07.98 ⁴⁰
28.2	59.336 ²⁶⁵	70.40 ⁹⁵	05.016 ²⁶⁶	30.24 ⁴³	25.269 ²⁹³	07.58 ¹¹
Sept. 7.2	59.601 ²⁴¹	71.35 ⁶⁹	05.282 ²⁴³	29.81 ⁵	25.562 ²⁶⁸	07.69 ⁶⁰
17.1	59.842 ²¹⁶	72.04 ⁴⁴	05.525 ²¹⁵	29.76 ³⁴	25.830 ²³⁶	08.29 ¹⁰⁸
27.1	60.058 ¹⁸⁸	72.48 ¹⁸	05.740 ¹⁸⁶	30.10 ⁶⁸	26.066 ²⁰²	09.37 ¹⁵⁰
Oct. 7.1	60.246 ¹⁶⁰	72.66 ⁶	05.926 ¹⁵⁶	30.78 ⁹⁹	26.268 ¹⁶⁵	10.87 ¹⁸⁷
17.0	60.406 ¹³⁰	72.60 ²⁸	06.082 ¹²³	31.77 ¹²⁶	26.433 ¹²⁷	12.74 ²¹⁷
27.0	60.536 ¹⁰¹	72.32 ⁴⁶	06.205 ⁹²	33.03 ¹⁴⁵	26.560 ⁸⁷	14.91 ²³⁶
Nov. 5.9	60.637 ⁷¹	71.86 ⁶¹	06.297 ⁶⁰	34.48 ¹⁵⁸	26.647 ⁴⁸	17.27 ²⁴⁶
15.9	60.708 ⁴¹	71.25 ⁷¹	06.357 ²⁸	36.06 ¹⁶⁴	26.695 ⁹	19.73 ²⁴⁸
25.9	60.749 ¹¹	70.54 ⁷⁸	06.385 ³	37.70 ¹⁶³	26.704 ²⁹	22.21 ²³⁸
Dec. 5.9	60.760 ¹⁹	69.76 ⁸¹	06.382 ³³	39.33 ¹⁵⁶	26.675 ⁶⁶	24.59 ²²¹
15.9	60.741 ⁴⁸	68.95 ⁸¹	06.349 ⁶³	40.89 ¹⁴³	26.609 ⁹⁹	26.80 ¹⁹⁵
25.9	60.693 ⁷⁴	68.14 ⁷⁹	06.286 ⁹⁰	42.32 ¹²⁶	26.510 ¹³¹	28.75 ¹⁶²
35.8	60.619	67.35	06.196	43.58	26.379	30.37
Mean Place	55.781	46.63	01.654	59.09	22.142	40.71
Sec δ , Tan δ	1.001	+ 0.052	1.031	- 0.252	1.188	- 0.641
a, a'	+3.1	+15.4	+2.9	+15.3	+2.5	+15.0
b, b'	0.00	- 0.6	-0.01	- 0.6	-0.03	- 0.7
Authority and Catalogue No.	A.N.	163	B.J.	164	B.J.	169

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	σ Arietis		ϵ Arietis m.		θ^1 Eridani	
Mag. Spect.	5.46	B ₅	4.64	A ₂	3.42	A ₂
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 2 47	^m +14 48	^h 2 55	^m +21 04	^h 2 55	^m -40 55
Jan. 0.8	55.630 ⁸⁴	65.76 ⁴²	31.121 ⁸⁴	65.63 ¹⁹	49.648 ¹⁷³	55.82 ²⁰⁰
10.8	55.546 ¹⁰⁸	65.34 ⁴⁷	31.037 ¹¹¹	65.44 ²⁸	49.475 ²⁰⁰	57.34 ²¹⁹
20.8	55.438 ¹²⁹	64.87 ⁵¹	30.926 ¹³³	65.16 ⁴²	49.275 ²¹⁹	58.44 ²³¹
30.8	55.309 ¹⁴³	64.36 ⁵⁴	30.793 ¹⁴⁹	64.74 ⁵¹	49.056 ²³¹	59.05 ²³⁵
Feb. 9.7	55.166 ¹⁴⁸	63.82 ⁵⁷	30.644 ¹⁵⁶	64.23 ⁶¹	48.825 ²³⁵	59.17 ²³⁵
19.7	55.018 ¹⁴⁴	63.25 ⁵⁴	30.488 ¹⁵²	63.62 ⁶⁷	48.590 ²²⁹	58.81 ²¹³
Mar. 1.7	54.874 ¹³¹	62.71 ⁵³	30.336 ¹⁴⁰	62.95 ⁷⁰	48.361 ²¹³	57.97 ¹⁸⁸
11.7	54.743 ¹⁰⁸	62.18 ⁴⁹	30.196 ¹¹⁸	62.25 ⁶⁸	48.148 ¹⁸⁸	56.61 ¹⁵⁴
21.6	54.635 ⁷⁸	61.69 ³⁵	30.078 ⁸⁸	61.57 ⁶³	47.960 ¹⁵⁴	54.91 ¹¹³
31.6	54.557 ⁴¹	61.34 ²³	29.990 ⁵⁰	60.94 ⁵⁷	47.806 ¹¹³	52.91 ⁶⁵
Apr. 10.6	54.516 ¹	61.11 ⁷	29.940 ⁵	60.37 ⁴³	47.693 ⁶⁵	50.48 ¹³
20.5	54.517 ⁴⁷	61.04 ¹³	29.935 ⁴³	59.94 ²⁶	47.628 ¹³	47.78 ⁴²
30.5	54.564 ⁹⁵	61.17 ³¹	29.978 ⁹⁴	59.68 ⁸	47.615 ⁴²	44.84 ⁹⁶
May 10.5	54.659 ¹⁴²	61.48 ⁵⁴	30.072 ¹⁴⁰	59.60 ¹²	47.657 ⁹⁶	41.73 ¹⁵⁰
20.5	54.801 ¹⁸⁷	62.02 ⁷⁴	30.212 ¹⁸⁷	59.72 ³⁷	47.753 ¹⁵⁰	38.52 ²⁰¹
30.4	54.988 ²²⁴	62.76 ⁹⁶	30.399 ²²⁵	60.09 ⁵⁹	47.903 ²⁰¹	35.29 ²⁴⁵
June 9.4	55.212 ²⁵⁹	63.72 ¹¹⁴	30.624 ²⁶²	60.68 ⁸¹	48.104 ²⁴⁵	32.11 ²⁸²
19.4	55.471 ²⁸⁸	64.86 ¹²⁹	30.886 ²⁹²	61.49 ⁹⁸	48.349 ²⁸²	29.05 ³¹⁴
29.4	55.759 ³⁰⁶	66.15 ¹⁴¹	31.178 ³¹³	62.47 ¹¹⁷	48.631 ³¹⁴	26.19 ³³⁸
July 9.3	56.065 ³¹⁸	67.56 ¹⁴⁸	31.491 ³²⁵	63.64 ¹²⁸	48.945 ³³⁸	23.61 ³⁵¹
19.3	56.383 ³²²	69.04 ¹⁵³	31.816 ³³⁰	64.92 ¹³⁹	49.283 ³⁵¹	21.38 ³⁵⁵
29.3	56.705 ³¹⁹	70.57 ¹⁵²	32.146 ³³²	66.31 ¹⁴⁴	49.634 ³⁵⁵	19.57 ³⁵³
Aug. 8.2	57.024 ³¹²	72.09 ¹⁴⁶	32.478 ³²⁵	67.75 ¹⁴⁵	49.989 ³⁵³	18.23 ³²⁰
18.2	57.336 ²⁹⁹	73.55 ¹³⁸	32.803 ³¹¹	69.20 ¹⁴²	50.342 ³³⁹	17.40 ³²⁰
28.2	57.635 ²⁷⁹	74.93 ¹²⁴	33.114 ²⁹²	70.62 ¹³⁴	50.681 ³²⁰	17.11 ²⁹⁰
Sept. 7.2	57.914 ²⁵⁸	76.17 ¹¹¹	33.406 ²⁷³	71.96 ¹²⁸	51.001 ²⁹³	17.37 ²⁶⁰
17.1	58.172 ²³¹	77.28 ⁹³	33.679 ²⁴⁶	73.24 ¹¹⁵	51.294 ²⁶⁰	18.17 ²²³
27.1	58.403 ²⁰⁵	78.21 ⁷⁶	33.925 ²²¹	74.39 ¹⁰³	51.554 ²²³	19.48 ¹⁸²
Oct. 7.1	58.608 ¹⁷⁶	78.97 ⁵⁸	34.146 ¹⁹²	75.42 ⁹⁰	51.777 ¹⁸²	21.26 ²⁴⁷
17.1	58.784 ¹⁴⁷	79.55 ⁴²	34.338 ¹⁶²	76.32 ⁷⁵	51.959 ¹³⁹	23.43 ²⁵⁰
27.0	58.931 ¹¹⁸	79.97 ²⁵	34.500 ¹³⁴	77.07 ⁶²	52.098 ⁹⁵	25.90 ²⁷⁴
Nov. 5.9	59.049 ⁸⁷	80.22 ¹³	34.634 ⁹⁹	77.69 ⁴⁸	52.193 ⁴⁸	28.59 ²⁷⁴
15.9	59.136 ⁵⁷	80.35 ⁵	34.733 ⁶⁶	78.17 ³⁶	52.241 ⁴	31.37 ²⁶⁴
25.9	59.193 ²⁴	80.30 ¹²	34.799 ³⁴	78.53 ²³	52.245 ⁴⁰	34.16 ²⁴⁶
Dec. 5.9	59.217 ⁷	80.18 ²³	34.833 ²	78.76 ¹²	52.205 ⁸²	36.84 ²⁴⁶
15.9	59.210 ³⁸	79.95 ³⁰	34.835 ³⁶	78.88 ²	52.123 ¹²¹	39.30 ²¹⁸
25.9	59.172 ⁷¹	79.65 ³⁸	34.799 ⁶⁸	78.86 ¹²	52.002 ¹⁵⁶	41.48 ¹⁸¹
35.8	59.101	79.27	34.731	78.74	51.846	43.29
Mean Place	53.945	55.35	29.356	53.58	47.763	51.25
Sec'd, Tan δ	1.034	+0.265	1.072	+0.385	1.316	-0.856
a, a'	+3.3	+14.9	+3.4	+14.4	+2.3	+14.4
b, b'	+0.01	-0.7	+0.02	-0.7	-0.04	-0.7
Authority and Catalogue No.	A.E.	170	A.E.	175	B.J.	176

† Second transit, Nov. 5

APPARENT PLACES OF STARS, 1935

377

AT UPPER TRANSIT AT GREENWICH

Name	α Ceti		γ Persei		ρ Persei	
Mag. Spect.	2.82	Ma	3.08	F5-A3	Var.	Mb
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 2 ^m 58	+ ^s 3 ['] 50	^h 3 ^m 00	+ ^s 53 ['] 15	^h 3 ^m 01	+ ^s 38 ['] 35
Jan. 0.8	54.422	16.29	06.753	32.08	02.136	39.63
10.8	54.343	15.55	06.588	33.10	02.030	40.10
20.8	54.239	14.87	06.379	33.73	01.890	40.30
30.8	54.114	14.26	06.135	33.93	01.721	40.21
Feb. 9.7	53.975	13.74	05.869	33.71	01.534	39.83
19.7	53.828	13.32	05.595	33.07	01.339	39.18
Mar. 1.7	53.683	13.02	05.327	32.04	01.147	38.28
11.7	53.548	12.85	05.081	30.66	00.969	37.17
21.6	53.433	12.83	04.871	29.01	00.818	35.90
31.6	53.346	12.99	04.712	27.15	00.705	34.54
Apr. 10.6	53.292	13.33	04.612	25.16	00.637	33.15
20.5	53.279	13.87	04.582	23.13	00.623	31.79
30.5	53.313	14.61	04.624	21.15	00.664	30.53
May 10.5	53.388	15.56	04.741	19.29	00.765	29.42
20.5	53.511	16.71	04.930	17.62	00.922	28.52
30.4	53.677	18.03	05.189	16.20	01.134	27.87
June 9.4	53.882	19.51	05.508	15.09	01.393	27.49
19.4	54.121	21.11	05.881	14.31	01.695	27.39
29.4	54.389	22.78	06.297	13.89	02.030	27.58
July 9.3	54.677	24.49	06.745	13.83	02.391	28.05
19.3	54.979	26.19	07.216	14.14	02.769	28.79
29.3	55.288	27.81	07.698	14.80	03.155	29.77
Aug. 8.2	55.597	29.33	08.181	15.79	03.541	30.97
18.2	55.900	30.69	08.657	17.09	03.920	32.35
28.2	56.190	31.85	09.116	18.66	04.286	33.87
Sept. 7.2	56.465	32.79	09.551	20.47	04.632	35.50
17.1	56.719	33.48	09.958	22.48	04.954	37.21
27.1	56.949	33.91	10.330	24.66	05.250	38.95
Oct. 7.1	57.153	34.10	10.662	26.95	05.515	40.71
17.1	57.331	34.04	10.953	29.32	05.747	42.44
27.0	57.481	33.77	11.198	31.72	05.946	44.13
Nov. 6.0	57.602†	33.32	11.394†	34.11	06.107	45.76
15.9	57.693	32.72	11.537	36.44	06.231	47.28
25.9	57.753	32.02	11.626	38.66	06.314	48.69
Dec. 5.9	57.782	31.24	11.657	40.72	06.354	49.94
15.9	57.779	30.43	11.631	42.55	06.352	51.01
25.9	57.745	29.62	11.548	44.10	06.308	51.87
35.8	57.681	28.84	11.410	45.33	06.223	52.48
Mean Place	52.713	09.24	04.412	12.42	00.142	23.17
Sec δ , Tan δ	1.002	+ 0.067	1.672	+ 1.339	1.279	+ 0.798
a, a'	+3.1	+14.2	+4.3	+14.2	+3.8	+14.1
b, b'	0.00	- 0.7	+0.06	- 0.7	+0.04	- 0.7
Authority and Catalogue No.	B.J.	179	B.J.	181	B.J.	182

† First transit, Nov. 6

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name Mag. Spect.	μ Horologii		β Persei (<i>Algol</i>)		δ Arietis	
	5.16	Fo	Var.	B8	4.53	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 3 ^m 02	[°] -59 ['] 58	^h 3 ^m 03	[°] +40 ['] 42	^h 3 ^m 07	[°] +19 ['] 28
Jan. 0.9	07.157	88.67	57.867	40.78	56.247	67.07
10.8	06.825 ³³²	90.26 ¹⁵⁹	57.757 ¹¹⁰	41.35 ⁵⁷	56.172 ⁷⁵	66.86 ²¹
20.8	06.454 ³⁷¹	91.31 ¹⁰⁵	57.611 ¹⁴⁶	41.63 ²⁸	56.068 ¹⁰⁴	66.56 ³⁰
30.8	06.057 ³⁹⁷	91.80 ⁴²	57.436 ¹⁷⁵	41.61 ²	55.939 ¹²⁹	66.17 ³⁹
Feb. 9.7	05.650 ⁴⁰⁷	91.70 ¹⁰	57.241 ¹⁹⁵	41.28 ³³	55.793 ¹⁴⁶	65.69 ⁴⁸
19.7	05.237 ⁴¹³	91.04 ⁶⁶	57.037 ²⁰⁴	40.66 ⁶²	55.637 ¹⁵⁶	65.15 ⁵⁴
Mar. 1.7	04.840 ³⁹⁷	89.84 ¹²⁰	56.836 ²⁰¹	39.76 ⁹⁰	55.482 ¹⁵⁵	64.55 ⁶⁰
11.7	04.467 ³⁷³	88.13 ¹⁷¹	56.649 ¹⁸⁷	38.63 ¹¹³	55.337 ¹⁴⁵	63.94 ⁶¹
21.6	04.130 ³³⁷	85.96 ²¹⁷	56.490 ¹⁵⁹	37.32 ¹³¹	55.211 ¹²⁶	63.35 ⁵⁹
31.6	03.843 ²⁸⁷	83.39 ²⁵⁷	56.369 ¹²¹	35.90 ¹⁴²	55.115 ⁹⁶	62.79 ⁵⁶
Apr. 10.6	03.615 ²²⁸	80.47 ²⁹²	56.295 ⁷⁴	34.42 ¹⁴⁸	55.056 ⁵⁹	62.33 ⁴⁶
20.6	03.453 ¹⁶²	77.27 ³²⁰	56.275 ²⁰	32.97 ¹⁴⁵	55.039 ¹⁷	61.98 ³⁵
30.5	03.365 ⁸⁸	73.85 ³⁴²	56.313 ³⁸	31.60 ¹³⁷	55.069 ³⁰	61.80 ¹⁸
May 10.5	03.353 ¹²	70.31 ³⁵⁴	56.411 ⁹⁸	30.38 ¹²²	55.148 ⁷⁹	61.79 ¹
20.5	03.421 ⁶⁸	66.70 ³⁶¹	56.569 ¹⁵⁸	29.35 ¹⁰³	55.276 ¹²⁸	61.99 ²⁰
30.4	03.562 ¹⁴¹	63.12 ³⁵⁸	56.781 ²¹²	28.57 ⁷⁸	55.449 ¹⁷³	62.40 ⁴¹
June 9.4	03.783 ²²¹	59.65 ³⁴⁷	57.044 ²⁶³	28.06 ⁵¹	55.665 ²¹⁶	63.01 ⁶¹
19.4	04.071 ²⁸⁸	56.38 ³²⁷	57.351 ³⁰⁷	27.84 ²²	55.916 ²⁵¹	63.82 ⁸¹
29.4	04.419 ³⁴⁸	53.38 ³⁰⁰	57.691 ³⁴⁰	27.91 ⁷	56.197 ²⁸¹	64.81 ⁹⁹
July 9.3	04.818 ³⁹⁹	50.75 ²⁶³	58.060 ³⁶⁹	28.28 ³⁷	56.501 ³⁰⁴	65.95 ¹¹⁴
19.3	05.257 ⁴³⁹	48.55 ²²⁰	58.446 ³⁸⁶	28.93 ⁶⁵	56.821 ³²⁰	67.21 ¹²⁶
Aug. 8.3	05.723 ⁴⁶⁶	46.85 ¹⁷⁰	58.842 ³⁹⁶	29.84 ⁹¹	57.149 ³²⁸	68.54 ¹³³
18.2	06.205 ⁴⁸²	45.69 ¹¹⁶	59.238 ³⁹⁶	30.97 ¹¹³	57.477 ³²⁸	69.91 ¹³⁷
28.2	06.690 ⁴⁸⁵	45.13 ⁵⁶	59.627 ³⁸⁹	32.31 ¹³⁴	57.800 ³²³	71.27 ¹³⁶
Sept. 7.2	07.161 ⁴⁷¹	45.17 ⁴	60.003 ³⁷⁶	33.82 ¹⁵¹	58.112 ³¹²	72.60 ¹³³
17.1	07.606 ⁴⁴⁵	45.82 ⁶⁵	60.360 ³⁵⁷	35.45 ¹⁶³	58.408 ²⁹⁶	73.86 ¹²⁶
27.1	08.016 ⁴¹⁰	47.07 ¹²⁵	60.694 ³³⁴	37.18 ¹⁷³	58.684 ²⁷⁶	75.01 ¹¹⁵
Oct. 7.1	08.378 ³⁶²	48.87 ¹⁸⁰	60.999 ³⁰⁵	38.97 ¹⁷⁹	58.938 ²⁵⁴	76.04 ¹⁰³
17.1	08.683 ³⁰⁵	51.16 ²²⁹	61.275 ²⁷⁶	40.78 ¹⁸¹	59.166 ²²⁸	76.93 ⁸⁹
27.0	08.925 ²⁴²	53.86 ²⁷⁰	61.517 ²⁴²	42.60 ¹⁸²	59.368 ²⁰²	77.68 ⁷⁵
Nov. 6.0	09.097 ¹⁷²	56.87 ³⁰¹	61.724 ²⁰⁷	44.39 ¹⁷⁹	59.542 ¹⁷⁴	78.29 ⁶¹
15.9	09.195 ⁹⁸	60.06 ³¹⁹	61.893 ¹⁶⁹	46.12 ¹⁷³	59.685 ¹⁴³	78.77 ⁴⁸
25.9	09.216 ²¹	63.33 ³²⁷	62.023 ¹³⁰	47.76 ¹⁶⁴	59.797 ¹¹²	79.12 ³⁵
Dec. 5.9	09.163 ⁵³	66.55 ³²²	62.110 ⁸⁷	49.29 ¹⁵³	59.877 ⁸⁰	79.35 ²³
15.9	09.038 ¹²⁵	69.60 ³⁰⁵	62.154 ⁴⁴	50.67 ¹³⁸	59.923 ⁴⁶	79.47 ¹²
25.9	08.845 ¹⁹³	72.37 ²⁷⁷	62.154 [—]	51.86 ¹¹⁹	59.934 ¹¹	79.49 ²
35.8	08.593 ²⁵²	74.76 ²³⁹	62.109 ⁴⁵	52.84 ⁹⁸	59.911 ²³	79.41 ⁸
	08.286 ³⁰⁷	76.69 ¹⁹³	62.020 ⁸⁹	53.56 ⁷²	59.852 ⁵⁹	79.24 ¹⁷
Mean Place	04.750	81.10	55.812	23.93	54.421	55.75
Sec δ , Tan δ	1.999	-1.731	1.319	+0.860	1.061	+0.354
α , α'	+1.4	+14.0	+3.9	+13.9	+3.4	+13.7
δ , δ'	-0.08	-0.7	+0.04	-0.7	+0.02	-0.7
Authority and Catalogue No.	B.J.	183	B.J.	185	B.J.	187

APPARENT PLACES OF STARS, 1935

379

AT UPPER TRANSIT AT GREENWICH

Name	τ^1 Arietis		α Persei		σ Tauri	
Mag. Spect.	5.17	B ₃	1.90	F ₅	3.80	G ₅
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 3 ^m 17	[°] +20 ['] 54	^h 3 ^m 19	[°] +49 ['] 37	^h 3 ^m 21	[°] +8 ['] 48
Jan. 0.9	30.041	61.97	42.634	71.39	20.526	13.32
10.8	29.969 ⁷²	61.83 ¹⁴	42.508 ¹²⁶	72.42 ¹⁰³	20.460 ⁶⁶	12.72 ⁶⁰
20.8	29.867 ¹⁰²	61.59 ²⁴	42.335 ¹⁷³	73.10 ⁶⁸	20.365 ⁹⁵	12.15 ⁵⁷
30.8	29.738 ¹²⁹	61.25 ³⁴	42.125 ²¹⁰	73.41 ³¹	20.244 ¹²¹	11.60 ⁵⁵
Feb. 9.8	29.592 ¹⁴⁶	60.81 ⁴⁴	41.888 ²³⁷	73.34 ⁷	20.105 ¹³⁹	11.09 ⁵¹
19.7	29.433 ¹⁵⁹	60.31 ⁵⁰	41.637 ²⁵¹	72.89 ⁴⁵	19.954 ¹⁵¹	10.64 ⁴⁵
Mar. 1.7	29.273 ¹⁶⁰	59.73 ⁵⁸	41.386 ²⁵¹	72.07 ⁸²	19.801 ¹⁵³	10.24 ⁴⁰
11.7	29.121 ¹⁵²	59.12 ⁶¹	41.150 ²³⁶	70.92 ¹¹⁵	19.655 ¹⁴⁶	09.94 ³⁰
21.6	28.989 ¹³²	58.49 ⁶³	40.943 ²⁰⁷	69.51 ¹⁴¹	19.526 ¹²⁹	09.73 ²¹
31.6	28.883 ¹⁰⁶	57.90 ⁵⁹	40.778 ¹⁶⁵	67.88 ¹⁶³	19.423 ¹⁰³	09.65 ⁸
Apr. 10.6	28.815 ⁶⁸	57.36 ⁵⁴	40.665 ¹¹³	66.11 ¹⁷⁷	19.352 ⁷¹	09.72 ⁷
20.6	28.790 ²⁵	56.94 ⁴²	40.615 ⁵⁰	64.29 ¹⁸²	19.321 ³¹	09.95 ²³
30.5	28.811 ²¹	56.66 ²⁸	40.630 ¹⁵	62.49 ¹⁸⁰	19.334 ¹³	10.37 ⁴²
May 10.5	28.881 ⁷⁰	56.56 ¹⁰	40.715 ⁸⁵	60.77 ¹⁷²	19.393 ⁵⁹	10.97 ⁶⁰
20.5	29.000 ¹¹⁹	56.65 ⁹	40.868 ¹⁵³	59.22 ¹⁵⁵	19.498 ¹⁰⁵	11.76 ⁷⁹
30.5	29.165 ¹⁶⁵	56.94 ²⁹	41.086 ²¹⁸	57.88 ¹³⁴	19.648 ¹⁵⁰	12.74 ⁹⁸
June 9.4	29.375 ²¹⁰	57.42 ⁴⁸	41.364 ²⁷⁸	56.80 ¹⁰⁸	19.839 ¹⁹¹	13.88 ¹¹⁴
19.4	29.620 ²⁴⁵	58.11 ⁶⁹	41.695 ³³¹	56.02 ⁷⁸	20.066 ²²⁷	15.16 ¹²⁸
29.4	29.899 ²⁷⁹	58.97 ⁸⁶	42.068 ³⁷³	55.56 ⁴⁶	20.323 ²⁵⁷	16.55 ¹³⁹
July 9.3	30.201 ³⁰²	60.01 ¹⁰⁴	42.476 ⁴⁰⁸	55.43 ¹³	20.605 ²⁸²	18.02 ¹⁴⁷
19.3	30.521 ³²⁰	61.17 ¹¹⁶	42.908 ⁴³²	55.62 ¹⁹	20.903 ²⁹⁸	19.50 ¹⁴⁸
29.3	30.849 ³²⁸	62.41 ¹²⁴	43.356 ⁴⁴⁸	56.13 ⁵¹	21.212 ³⁰⁹	20.98 ¹⁴⁸
Aug. 8.3	31.180 ³³¹	63.69 ¹²⁸	43.808 ⁴⁵²	56.93 ⁸⁰	21.523 ³¹¹	22.39 ¹⁴¹
18.2	31.506 ³²⁶	65.00 ¹³¹	44.258 ⁴⁵⁰	58.02 ¹⁰⁹	21.832 ³⁰⁹	23.69 ¹³⁰
28.2	31.823 ³¹⁷	66.27 ¹²⁷	44.696 ⁴³⁸	59.35 ¹³³	22.132 ³⁰⁰	24.86 ¹¹⁷
Sept. 7.2	32.126 ³⁰³	67.49 ¹²²	45.116 ⁴²⁰	60.90 ¹⁵⁵	22.418 ²⁸⁶	25.84 ⁹⁸
17.2	32.410 ²⁸⁴	68.63 ¹¹⁴	45.514 ³⁹⁸	62.63 ¹⁷³	22.688 ²⁷⁰	26.62 ⁷⁸
27.1	32.674 ²⁶⁴	69.65 ¹⁰²	45.882 ³⁶⁸	64.51 ¹⁸⁸	22.937 ²⁴⁹	27.19 ⁵⁷
Oct. 7.1	32.911 ²³⁷	70.56 ⁹¹	46.218 ³³⁶	66.50 ¹⁹⁹	23.163 ²²⁶	27.54 ³⁵
17.1	33.123 ²¹²	71.34 ⁷⁸	46.517 ²⁹⁹	68.57 ²⁰⁷	23.365 ²⁰²	27.69 ¹⁵
27.0	33.307 ¹⁸⁴	71.99 ⁶⁵	46.776 ²⁵⁹	70.69 ²¹²	23.540 ¹⁷⁵	27.64 ⁵
Nov. 6.0	33.462 ¹⁵⁵	72.52 ⁵³	46.992 ²¹⁶	72.80 ²¹¹	23.687 ¹⁴⁷	27.42 ²²
15.9	33.586 ¹²⁴	72.93 ⁴¹	47.160 ¹⁶⁸	74.89 ²⁰⁹	23.804 ¹¹⁷	27.06 ³⁶
25.9	33.677 ⁹¹	73.22 ²⁹	47.278 ¹¹⁸	76.89 ²⁰⁰	23.889 ⁸⁵	26.60 ⁴⁶
Dec. 5.9	33.733 ⁵⁶	73.42 ²⁰	47.343 ⁶⁵	78.77 ¹⁸⁸	23.942 ⁵³	26.06 ⁵⁴
15.9	33.753 ²⁰	73.51 ⁹	47.352 ⁹	80.47 ¹⁷⁰	23.962 ²⁰	25.46 ⁶⁰
25.9	33.736 ¹⁷	73.51 [—]	47.307 ⁴⁵	81.94 ¹⁴⁷	23.947 ¹⁵	24.85 ⁶¹
35.9	33.684 ⁵²	73.41 ¹⁰	47.208 ⁹⁹	83.14 ¹²⁰	23.898 ⁴⁹	24.23 ⁶²
Mean Place	28.147	50.51	40.219	53.39	18.692	05.16
Sec δ , Tan δ	1.071	+ 0.382	1.544	+ 1.176	1.012	+ 0.155
α , α'	+3.5	+13.1	+4.3	+12.9	+3.2	+12.8
b , b'	+0.02	- 0.8	+0.05	- 0.8	+0.01	- 0.8
Authority and Catalogue No.	A.E.	197	B.J.	200	B.J.	201

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	f Tauri		ε Eridani		45 G Horologii	
Mag. Spect.	4.28	Ko	3.81	Ko	5.60	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 3 ^m 27	[°] +12 ['] 42	^h 3 ^m 29	[°] - 9 ['] 40	^h 3 ^m 30	[°] -50 ['] 35
Jan. 0.9	18.700 ⁶²	64.18 ⁴⁵	53.783 ⁷⁸	34.41 ¹²³	40.519 ²¹³	59.31 ¹⁹⁶
10.8	18.638 ⁹³	63.73 ⁴⁶	53.705 ¹⁰⁷	35.64 ¹⁰²	40.306 ²⁵²	61.27 ¹⁴⁸
20.8	18.545 ¹¹⁹	63.27 ⁴⁷	53.598 ¹³¹	36.66 ⁸¹	40.054 ²⁸²	62.75 ⁹⁶
30.8	18.426 ¹⁴⁰	62.80 ⁴⁷	53.467 ¹⁵⁰	37.47 ⁵⁷	39.772 ³⁰³	63.71 ⁴³
Feb. 9.8	18.286 ¹⁵³	62.33 ⁴⁶	53.317 ¹⁶¹	38.04 ³³	39.469 ³¹⁴	64.14 ¹¹
19.7	18.133 ¹⁵⁶	61.87 ⁴⁴	53.156 ¹⁶⁵	38.37 ⁷	39.155 ³¹⁴	64.03 ⁶⁴
Mar. 1.7	17.977 ¹⁴⁹	61.43 ³⁹	52.991 ¹⁵⁷	38.44 ²⁰	38.841 ³⁰¹	63.39 ¹¹⁵
11.7	17.828 ¹³⁴	61.04 ³³	52.834 ¹⁴²	38.24 ⁴⁵	38.540 ²⁷⁷	62.24 ¹⁶³
21.7	17.694 ¹⁰⁸	60.71 ²⁴	52.692 ¹¹⁸	37.79 ⁷¹	38.263 ²⁴⁴	60.61 ²⁰⁶
31.6	17.586 ⁷⁵	60.47 ¹³	52.574 ⁸⁸	37.08 ⁹⁶	38.019 ²⁰⁰	58.55 ²⁴⁶
Apr. 10.6	17.511 ³⁵	60.34 ²	52.486 ⁴⁷	36.12 ¹²¹	37.819 ¹⁴⁹	56.09 ²⁷⁸
20.6	17.476 ⁹	60.36 ¹⁸	52.439 ⁶	34.91 ¹⁴³	37.670 ⁹¹	53.31 ³⁰⁵
30.5	17.485 ⁵⁶	60.54 ³⁷	52.433 ³⁹	33.48 ¹⁶⁵	37.579 ²⁹	50.26 ³²⁶
May 10.5	17.541 ¹⁰³	60.91 ⁵⁴	52.472 ⁸⁶	31.83 ¹⁸²	37.550 ³⁵	47.00 ³³⁹
20.5	17.644 ¹⁴⁸	61.45 ⁷³	52.558 ¹²⁸	30.01 ¹⁹⁷	37.585 ⁹⁹	43.61 ³⁴⁴
30.5	17.792 ¹⁹⁰	62.18 ⁹¹	52.686 ¹⁷¹	28.04 ²⁰⁷	37.684 ¹⁶¹	40.17 ³⁴¹
June 9.4	17.982 ²²⁷	63.09 ¹⁰⁶	52.857 ²⁰⁹	25.97 ²¹²	37.845 ²¹⁷	36.76 ³³⁰
19.4	18.209 ²⁵⁹	64.15 ¹²⁰	53.066 ²⁴⁰	23.85 ²¹²	38.062 ²⁷⁰	33.46 ³¹¹
29.4	18.468 ²⁸³	65.35 ¹²⁹	53.306 ²⁶⁵	21.73 ²⁰⁶	38.332 ³¹⁴	30.35 ²⁸³
July 9.4	18.751 ³⁰¹	66.64 ¹³⁵	53.571 ²⁸⁵	19.67 ¹⁹⁵	38.646 ³⁵⁰	27.52 ²⁴⁶
19.3	19.052 ³¹²	67.99 ¹³⁷	53.856 ²⁹⁶	17.72 ¹⁷⁶	38.996 ³⁷⁶	25.06 ²⁰⁴
29.3	19.354 ³¹⁶	69.36 ¹³⁴	54.152 ³⁰¹	15.96 ¹⁵⁴	39.372 ³⁹³	23.02 ¹⁵⁴
Aug. 8.3	19.680 ³¹³	70.70 ¹²⁷	54.453 ³⁰⁰	14.42 ¹²⁵	39.765 ⁴⁰⁰	21.48 ¹⁰⁰
18.2	19.993 ³⁰⁶	71.97 ¹¹⁷	54.753 ²⁹³	13.17 ⁹⁴	40.165 ³⁹⁶	20.48 ⁴¹
28.2	20.299 ²⁹³	73.14 ¹⁰³	55.046 ²⁸¹	12.23 ⁶⁰	40.561 ³⁸³	20.07 ¹⁸
Sept. 7.2	20.592 ²⁷⁷	74.17 ⁸⁷	55.327 ²⁶⁴	11.63 ²²	40.944 ³⁵⁹	20.25 ⁷⁸
17.2	20.869 ²⁵⁷	75.04 ⁶⁹	55.591 ²⁴³	11.41 ¹⁴	41.303 ³²⁹	21.03 ¹³⁵
27.1	21.126 ²³⁵	75.73 ⁵¹	55.834 ²²⁰	11.55 ⁴⁹	41.632 ²⁹⁰	22.38 ¹⁸⁸
Oct. 7.1	21.361 ²¹¹	76.24 ³²	56.054 ¹⁹⁵	12.04 ⁸¹	41.922 ²⁴⁶	24.26 ²³⁴
17.1	21.572 ¹⁸⁴	76.56 ¹⁵	56.249 ¹⁶⁸	12.85 ¹¹⁰	42.168 ¹⁹⁵	26.60 ²⁷¹
27.1	21.756 ¹⁵⁶	76.71 [—]	56.417 ¹³⁸	13.95 ¹³⁰	42.363 ¹⁴²	29.31 ²⁹⁹
Nov. 6.0	21.912 ¹²⁷	76.71 ¹³	56.555 ¹⁰⁶	15.25 ¹⁴⁹	42.505 ⁸⁵	32.30 ³¹⁵
15.9	22.039 ⁹⁵	76.58 ²⁴	56.661 ⁷⁵	16.74 ¹⁵⁸	42.590 ²⁷	35.45 ³¹⁹
25.9	22.134 ⁶¹	76.34 ³²	56.736 ⁴¹	18.32 ¹⁶⁰	42.617 ³⁰	38.64 ³¹¹
Dec. 5.9	22.195 ²⁷	76.02 ³⁸	56.777 ⁷	19.92 ¹⁵⁸	42.587 ⁸⁶	41.75 ²⁹²
15.9	22.222 ⁹	75.64 ⁴³	56.784 ²⁸	21.50 ¹⁴⁹	42.501 ¹³⁹	44.67 ²⁶²
25.9	22.213 ⁴³	75.21 ⁴⁵	56.756 ⁶⁰	22.99 ¹³⁵	42.362 ¹⁸⁸	47.29 ²²⁵
35.9	22.170	74.76	56.696	24.34	42.174	49.54
Mean Place	16.816	55.11	51.962	37.54	38.292	54.17
Secδ, Tanδ	1.025	+ 0.226	1.014	- 0.171	1.575	- 1.217
a, a'	+3.3	+12.4	+2.9	+12.2	+1.8	+12.2
b, b'	+0.01	- 0.8	-0.01	- 0.8	-0.05	- 0.8
Authority and Catalogue No.	B.J.	207	A.E.	210	A.N.	211

No. 210. Corrected for a parallax of 0".30

APPARENT PLACES OF STARS, 1935

381

AT UPPER TRANSIT AT GREENWICH

Name	7 ⁵ Eridani		11 Tauri		8 Persei	
	4.32	B8	6.15	Ao	3.10	B5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 3 30	^m -21 50	^h 3 36	^m +25 07	^h 3 38	^m +47 34
Jan. 0.9	56.754	58.91	55.069	26.53	19.712	69.81
10.8	56.660 ⁹⁴	60.48 ¹⁵⁷	55.009 ⁶⁰	26.60 ⁷	19.612 ¹⁰⁰	70.87 ¹⁰⁶
20.8	56.537 ¹²³	61.76 ¹²⁸	54.913 ⁹⁶	26.56 ⁴	19.464 ¹⁴⁸	71.62 ⁷⁵
30.8	56.389 ¹⁴⁸	62.70 ⁹⁴	54.787 ¹²⁶	26.38 ¹⁸	19.275 ¹⁸⁹	72.05 ⁴³
Feb. 9.8	56.222 ¹⁶⁷	63.32 ⁶²	54.637 ¹⁵⁰	26.08 ³⁰	19.055 ²²⁰	72.12 ⁷
	56.042 ¹⁸⁰	63.56 ²⁴	54.471 ¹⁶⁶	25.66 ⁴²	18.817 ²³⁸	71.83 ²⁹
Mar. 19.7	55.860 ¹⁸²	63.46 ¹⁰	54.301 ¹⁷⁰	25.12 ⁵⁴	18.573 ²⁴⁴	71.20 ⁶³
1.7	55.684 ¹⁷⁶	62.99 ⁴⁷	54.136 ¹⁶⁵	24.50 ⁶²	18.338 ²³⁵	70.25 ⁹⁵
11.7	55.523 ¹⁶¹	62.16 ⁸³	53.987 ¹⁴⁹	23.81 ⁶⁹	18.127 ²¹¹	69.03 ¹²²
21.7	55.388 ¹³⁵	61.02 ¹¹⁴	53.864 ¹²³	23.10 ⁷¹	17.952 ¹⁷⁵	67.58 ¹⁴⁵
31.6	55.284 ¹⁰⁴	59.55 ¹⁴⁷	53.777 ⁸⁷	22.43 ⁶⁷	17.824 ¹²⁸	65.99 ¹⁵⁹
Apr. 10.6	55.217 ⁶⁷	57.79 ¹⁷⁶	53.732 ⁴⁵	21.80 ⁶³	17.754 ⁷⁰	64.30 ¹⁶⁹
20.6	55.197 ²⁰	55.78 ²⁰¹	53.734 ²	21.27 ⁵³	17.746 ⁸	62.63 ¹⁶⁷
30.5	55.221 ²⁴	53.55 ²²³	53.786 ⁵²	20.89 ³⁸	17.804 ⁵⁸	61.01 ¹⁶²
May 10.5	55.293 ⁷²	51.15 ²⁴⁰	53.889 ¹⁰³	20.66 ²³	17.929 ¹²⁵	59.51 ¹⁵⁰
20.5	55.411 ¹¹⁸	48.61 ²⁵⁴	54.041 ¹⁵²	20.63 ³	18.117 ¹⁸⁸	58.20 ¹³¹
June 30.5	55.574 ¹⁶³	46.03 ²⁵⁸	54.239 ¹⁹⁸	20.79 ¹⁶	18.365 ²⁴⁸	57.11 ¹⁰⁹
9.4	55.776 ²⁰²	43.42 ²⁶¹	54.477 ²³⁸	21.15 ³⁶	18.665 ³⁰⁰	56.28 ⁸³
19.4	56.015 ²³⁹	40.88 ²⁵⁴	54.749 ²⁷²	21.70 ⁵⁵	19.011 ³⁴⁶	55.74 ⁵⁴
29.4	56.279 ²⁶⁴	38.47 ²⁴¹	55.049 ³⁰⁰	22.42 ⁷²	19.392 ³⁸¹	55.49 ²⁵
July 9.4	56.568 ²⁸⁹	36.26 ²²¹	55.368 ³¹⁹	23.29 ⁸⁷	19.801 ⁴⁰⁹	55.54 ⁵
19.3	56.870 ³⁰²	34.32 ¹⁹⁴	55.701 ³³³	24.29 ¹⁰⁰	20.227 ⁴²⁶	55.88 ³⁴
Aug. 29.3	57.179 ³⁰⁹	32.71 ¹⁶¹	56.039 ³³⁸	25.38 ¹⁰⁹	20.663 ⁴³⁶	55.88 ⁶²
8.3	57.488 ³⁰⁹	31.47 ¹²⁴	56.376 ³³⁷	26.52 ¹¹⁴	21.099 ⁴³⁶	56.50 ⁸⁸
18.2	57.792 ³⁰⁴	30.65 ⁸²	56.707 ³³¹	27.68 ¹¹⁶	21.529 ⁴³⁰	57.38 ¹¹¹
28.2	58.085 ²⁹³	30.27 ³⁸	57.026 ³¹⁹	28.83 ¹¹⁵	21.945 ⁴¹⁶	58.49 ¹³¹
Sept. 7.2	58.360 ²⁷⁵	30.36 ⁹	57.330 ³⁰⁴	29.93 ¹¹⁰	22.342 ³⁹⁷	59.80 ¹⁴⁹
17.2	58.614 ²⁵⁴	30.88 ⁵²	57.614 ²⁸⁴	30.98 ¹⁰⁵	22.715 ³⁷³	61.29 ¹⁶³
27.1	58.844 ²³⁰	31.85 ⁹⁷	57.876 ²⁶²	31.95 ⁹⁷	23.059 ³⁴⁴	62.92 ¹⁷⁵
Oct. 7.1	59.046 ²⁰²	33.18 ¹³³	58.113 ²³⁷	32.83 ⁸⁸	23.372 ³¹³	64.67 ¹⁸³
17.1	59.218 ¹⁷²	34.84 ¹⁶⁶	58.324 ²¹¹	33.62 ⁷⁹	23.647 ²⁷⁵	66.50 ¹⁸⁸
27.1	59.356 ¹³⁸	36.76 ¹⁹²	58.504 ¹⁸⁰	34.31 ⁶⁹	23.883 ²³⁶	68.38 ¹⁹¹
Nov. 6.0	59.462 ¹⁰⁶	38.87 ²¹¹	58.653 ¹⁴⁹	34.91 ⁶⁰	24.075 ¹⁹²	70.29 ¹⁹⁰
16.0	59.534 ⁷²	41.06 ²¹⁹	58.769 ¹¹⁶	35.42 ⁵¹	24.219 ¹⁴⁴	72.19 ¹⁸⁵
Dec. 25.9	59.567 ³³	43.27 ²²¹	58.847 ⁷⁸	35.84 ⁴²	24.312 ⁹³	74.04 ¹⁷⁶
5.9	59.564 ³	45.37 ²¹⁰	58.887 ⁴⁰	36.17 ³³	24.350 ³⁸	75.80 ¹⁶²
15.9	59.525 ³⁹	47.35 ¹⁹⁸	58.888 ¹	36.40 ²³	24.334 ¹⁶	77.42 ¹⁴³
25.9	59.449 ⁷⁶	49.11 ¹⁷⁶	58.848 ⁴⁰	36.53 ¹³	24.263 ⁷¹	78.85 ¹²¹
35.9						80.06
Mean Place	54.887	59.26	53.027	14.65	17.200	53.20
Secδ, Tanδ	1.077	-0.401	1.104	+0.469	1.482	+1.094
a, a'	+2.6	+12.1	+3.6	+11.7	+4.3	+11.6
b, b'	-0.02	-0.8	+0.02	-0.8	+0.04	-0.8
Authority and Catalogue No.	A.E.	212	N.A.	217	B.J.	218

§ Transit, Nov. 15

† First transit, Nov. 16

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	δ Eridani		ι7 Tauri		η Tauri	
Mag. Spect.	3.72	Ko	3.81	B5p	2.96	B5p
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 3 40 ^m	[°] - 9 58 ^s	^h 3 41 ^m	[°] +23 54 ^s	^h 3 43 ^m	[°] +23 54 ^s
Jan. 0.9	09.825 ⁶⁸	52.96 ¹²⁷	02.653 ⁵⁶	49.01 ³	38.980 ⁵⁴	31.52 ³
10.8	09.757 ⁹⁹	54.23 ¹⁰⁸	02.597 ⁹²	49.04 ⁸	38.926 ⁹⁰	31.55 ⁷
20.8	09.658 ¹²⁵	55.31 ⁸⁵	02.505 ¹²³	48.96 ¹⁹	38.836 ¹²³	31.48 ¹⁸
30.8	09.533 ¹⁴⁷	56.16 ⁶²	02.382 ¹⁴⁸	48.77 ³⁰	38.713 ¹⁴⁷	31.30 ²⁹
Feb. 9.8	09.386 ¹⁶¹	56.78 ³⁷	02.234 ¹⁶³	48.47 ⁴¹	38.566 ¹⁶⁴	31.01 ⁴⁰
19.7	09.225 ¹⁶⁵	57.15 ¹¹	02.071 ¹⁶⁹	48.06 ⁵¹	38.402 ¹⁷⁰	30.61 ⁵⁰
Mar. 1.7	09.060 ¹⁶²	57.26 ¹⁵	01.902 ¹⁶⁵	47.55 ⁵⁹	38.232 ¹⁶⁶	30.11 ⁵⁷
11.7	08.898 ¹⁴⁸	57.11 ⁴¹	01.737 ¹⁵⁰	46.96 ⁶³	38.066 ¹⁵²	29.54 ⁶²
21.7	08.750 ¹²⁶	56.70 ⁶⁸	01.587 ¹²⁴	46.33 ⁶⁴	37.914 ¹²⁶	28.92 ⁶⁵
31.6	08.624 ⁹⁶	56.02 ⁹⁴	01.463 ⁹⁰	45.69 ⁶³	37.788 ⁹²	28.27 ⁶²
Apr. 10.6	08.528 ⁵⁹	55.08 ¹¹⁸	01.373 ⁴⁸	45.06 ⁵⁶	37.696 ⁵⁰	27.65 ⁵⁶
20.6	08.469 ¹⁷	53.90 ¹⁴²	01.325 ⁴⁶	44.50 ⁴⁶	37.646 ⁴	27.09 ⁴⁶
30.5	08.452 ²⁷	52.48 ¹⁶³	01.323 ⁴⁸	44.04 ³²	37.642 ⁴⁵	26.63 ³³
May 10.5	08.479 ⁷³	50.85 ¹⁸²	01.371 ⁹⁸	43.72 ¹⁶	37.687 ⁹⁶	26.30 ¹⁶
20.5	08.552 ¹¹⁸	49.03 ¹⁹⁷	01.469 ¹⁴⁶	43.56 ²	37.783 ¹⁴⁴	26.14 ¹
30.5	08.670 ¹⁶⁰	47.06 ²⁰⁷	01.615 ¹⁹²	43.58 ²¹	37.927 ¹⁹⁰	26.15 ²⁰
June 9.4	08.830 ¹⁹⁸	44.99 ²¹⁴	01.807 ²³³	43.79 ⁴⁰	38.117 ²³⁰	26.35 ³⁹
19.4	09.028 ²³¹	42.85 ²¹⁴	02.040 ²⁶⁶	44.19 ⁵⁸	38.347 ²⁶⁴	26.74 ⁵⁸
29.4	09.259 ²⁵⁹	40.71 ²⁰⁹	02.306 ²⁹⁵	44.77 ⁷⁵	38.611 ²⁹³	27.32 ⁷³
July 9.4	09.518 ²⁷⁹	38.62 ¹⁹⁸	02.601 ³¹⁵	45.52 ⁸⁹	38.904 ³¹³	28.05 ⁸⁸
19.3	09.797 ²⁹²	36.64 ¹⁸¹	02.916 ³²⁸	46.41 ¹⁰⁰	39.217 ³²⁷	28.93 ⁹⁸
29.3	10.089 ³⁰⁰	34.83 ¹⁵⁹	03.244 ³³⁵	47.41 ¹⁰⁷	39.544 ³³⁴	29.91 ¹⁰⁵
Aug. 8.3	10.389 ³⁰²	33.24 ¹³¹	03.579 ³³⁴	48.48 ¹¹²	39.878 ³³⁴	30.96 ¹¹⁰
18.2	10.691 ²⁹⁶	31.93 ⁹⁹	03.913 ³²⁹	49.60 ¹¹³	40.212 ³²⁹	32.06 ¹¹¹
28.2	10.987 ²⁸⁶	30.94 ⁶⁴	04.242 ³¹⁸	50.73 ¹¹⁰	40.541 ³¹⁸	33.17 ¹⁰⁸
Sept. 7.2	11.273 ²⁷¹	30.30 ²⁷	04.560 ³⁰²	51.83 ¹⁰⁵	40.859 ³⁰⁴	34.25 ¹⁰³
17.2	11.544 ²⁵³	30.03 ¹⁰	04.862 ²⁸⁴	52.88 ⁹⁸	41.163 ²⁸⁶	35.28 ⁹⁶
27.1	11.797 ²³²	30.13 ⁴⁵	05.146 ²⁶³	53.86 ⁸⁹	41.449 ²⁶⁴	36.24 ⁸⁷
Oct. 7.1	12.029 ²⁰⁷	30.58 ⁷⁹	05.409 ²³⁸	54.75 ⁸⁰	41.713 ²⁴²	37.11 ⁷⁹
17.1	12.236 ¹⁸¹	31.37 ¹⁰⁷	05.647 ²¹²	55.55 ⁷⁰	41.955 ²¹⁵	37.90 ⁶⁸
27.1	12.417 ¹⁵²	32.44 ¹³¹	05.859 ¹⁸⁴	56.25 ⁶⁰	42.170 ¹⁸⁶	38.58 ⁵⁹
Nov. 6.0	12.569 ¹²²	33.75 ¹⁴⁹	06.043 ¹⁵²	56.85 ⁵¹	42.356 ¹⁵⁵	39.17 ⁵⁰
16.0	12.691 ⁸⁹	35.24 ¹⁶⁰	06.195 ¹¹⁸	57.36 ⁴²	42.511 ¹²²	39.67 ⁴²
25.9	12.780 ⁵⁵	36.84 ¹⁶⁴	06.313 ⁸²	57.78 ³⁴	42.633 ⁸⁵	40.09 ³³
Dec. 5.9	12.835 ²¹	38.48 ¹⁶¹	06.395 ⁴⁴	58.12 ²⁵	42.718 ⁴⁷	40.42 ²⁵
15.9	12.856 ¹⁵	40.09 ¹⁵³	06.439 ⁴	58.37 ¹⁷	42.765 ⁷	40.67 ¹⁷
25.9	12.841 ⁵⁰	41.62 ¹⁴¹	06.443 ³⁵	58.54 ⁷	42.772 ³³	40.84 ⁸
35.9	12.791	43.03	06.408	58.61	42.739	40.92
Mean Place	07.952	56.17	00.604	37.57	36.916	20.16
Secδ, Tanδ	1.015	- 0.176	1.094	+ 0.443	1.094	+ 0.443
a, a'	+2.9	+11.5	+3.6	+11.4	+3.6	+11.2
b, b'	-0.01	- 0.8	+0.02	- 0.8	+0.02	- 0.8
Authority and Catalogue No.	A.N.	221	A.N.	224	B.J.	228

† First transit Nov. 16

APPARENT PLACES OF STARS, 1935

383

AT UPPER TRANSIT AT GREENWICH

Name	γ Hydri		ζ Persei		ϵ Persei	
Mag. Spect.	3.17	Ma	2.91	Br	2.96	Br
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 3 48 ^m	[°] -74 25 [']	^h 3 50 ^m	[°] +31 41 [']	^h 3 53 ^m	[°] +39 49 [']
Jan. 0.9	17.47 ⁶⁶	85.35 ²⁰⁷	04.588 ⁵⁶	44.42 ⁴⁰	31.466 ⁶⁵	40.25 ⁷⁹
10.9	16.81 ⁷⁵	87.42 ¹⁵⁴	04.532 ⁹⁶	44.82 ²⁴	31.401 ¹¹⁰	41.04 ⁵⁷
20.8	16.06 ⁸¹	88.96 ⁹⁸	04.436 ¹³¹	45.06 ⁶	31.291 ¹⁴⁹	41.61 ³²
30.8	15.25 ⁸⁷	89.94 ⁴⁰	04.305 ¹⁶⁰	45.12 ¹²	31.142 ¹⁸¹	41.93 ⁵
Feb. 9.8	14.38 ⁸⁷	90.34 ¹⁹	04.145 ¹⁷⁸	45.00 ³²	30.961 ²⁰²	41.98 ²²
19.7	13.51 ⁸⁸	90.15 ⁷⁵	03.967 ¹⁸⁶	44.68 ⁵⁰	30.759 ²¹¹	41.76 ⁴⁹
Mar. 1.7	12.63 ⁸⁵	89.40 ¹²⁸	03.781 ¹⁸³	44.18 ⁶⁶	30.548 ²⁰⁷	41.27 ⁷⁴
11.7	11.78 ⁸⁰	88.12 ¹⁷⁹	03.598 ¹⁶⁷	43.52 ⁷⁹	30.341 ¹⁹⁰	40.53 ⁹⁵
21.7	10.98 ⁷²	86.33 ²²³	03.431 ¹⁴¹	42.73 ⁸⁹	30.151 ¹⁶²	39.58 ¹¹¹
31.6	10.26 ⁶⁴	84.10 ²⁶³	03.290 ¹⁰⁵	41.84 ⁹²	29.989 ¹²²	38.47 ¹²³
Apr. 10.6	09.62 ⁵³	81.47 ²⁹⁷	03.185 ⁶¹	40.92 ⁹³	29.867 ⁷⁴	37.24 ¹²⁹
20.6	09.09 ⁴¹	78.50 ³²³	03.124 ¹¹	39.99 ⁸⁷	29.793 ¹⁹	35.95 ¹²⁸
30.6	08.68 ²⁸	75.27 ³⁴³	03.113 ⁴¹	39.12 ⁷⁸	29.774 ³⁹	34.67 ¹²³
May 10.5	08.40 ¹⁴	71.84 ³⁵⁴	03.154 ¹⁴⁷	38.34 ⁶⁴	29.813 ⁹⁷	33.44 ¹¹⁰
20.5	08.26 [—]	68.30 ³⁵⁸	03.249 ¹⁴⁷	37.70 ⁴⁷	29.910 ¹⁵⁴	32.34 ⁹⁵
30.5	08.26 ¹⁴	64.72 ³⁵²	03.396 ¹⁹⁵	37.23 ²⁷	30.064 ²⁰⁹	31.39 ⁷⁶
June 9.4	08.40 ²⁷	61.20 ³³⁹	03.591 ²⁴⁰	36.96 ⁷	30.273 ²⁵⁶	30.63 ⁵³
19.4	08.67 ⁴¹	57.81 ³¹⁷	03.831 ²⁷⁶	36.89 ¹⁴	30.529 ²⁹⁸	30.10 ³⁰
29.4	09.08 ⁵¹	54.64 ²⁸⁶	04.107 ³⁰⁸	37.03 ³⁴	30.827 ³³²	29.80 ⁵
July 9.4	09.59 ⁶²	51.78 ²⁴⁶	04.415 ³³⁰	37.37 ⁵³	31.159 ³⁵⁹	29.75 ¹⁸
19.3	10.21 ⁷¹	49.32 ²⁰⁰	04.745 ³⁴⁷	37.90 ⁷⁰	31.518 ³⁷⁶	29.93 ⁴¹
29.3	10.92 ⁷⁶	47.32 ¹⁴⁷	05.092 ³⁵⁴	38.60 ⁸⁴	31.894 ³⁸⁷	30.34 ⁶²
Aug. 8.3	11.68 ⁸¹	45.85 ⁹⁰	05.446 ³⁵⁷	39.44 ⁹⁶	32.281 ³⁹⁰	30.96 ⁸¹
18.3	12.49 ⁸²	44.95 ²⁸	05.803 ³⁵²	40.40 ¹⁰⁴	32.671 ³⁸⁶	31.77 ⁹⁷
28.2	13.31 ⁸¹	44.67 ³⁵	06.155 ³⁴²	41.44 ¹⁰⁹	33.057 ³⁷⁷	32.74 ¹¹⁰
Sept. 7.2	14.12 ⁷⁷	45.02 ⁹⁷	06.497 ³²⁸	42.53 ¹¹³	33.434 ³⁶²	33.84 ¹²²
17.2	14.89 ⁷¹	45.99 ¹⁵⁷	06.825 ³¹⁰	43.66 ¹¹³	33.796 ³⁴³	35.06 ¹³⁰
27.1	15.60 ⁶³	47.56 ²¹²	07.135 ²⁸⁹	44.79 ¹¹¹	34.139 ³²⁰	36.36 ¹³⁵
Oct. 7.1	16.23 ⁵²	49.68 ²⁶⁰	07.424 ²⁶⁴	45.90 ¹⁰⁹	34.459 ²⁹⁴	37.71 ¹⁴⁰
17.1	16.75 ³⁹	52.28 ²⁹⁸	07.688 ²³⁷	46.99 ¹⁰⁵	34.753 ²⁶⁵	39.11 ¹⁴²
27.1	17.14 ²⁶	55.26 ³²⁶	07.925 ²⁰⁸	48.04 ¹⁰⁰	35.018 ²³⁰	40.53 ¹⁴¹
Nov. 6.0	17.40 ¹¹	58.52 ³⁴¹	08.133 ¹⁷³	49.04 ⁹⁴	35.248 ¹⁹⁴	41.94 ¹⁴⁰
16.0	17.51 ⁴	61.93 ³⁴⁴	08.306 ¹³⁸	49.98 ⁸⁸	35.442 ¹⁵²	43.34 ¹³⁶
25.9	17.47 ¹⁹	65.37 ³³⁵	08.444 ⁹⁷	50.86 ⁸⁰	35.594 ¹⁰⁸	44.70 ¹²⁹
Dec. 5.9	17.28 ³³	68.72 ³¹³	08.541 ⁵⁵	51.66 ⁷²	35.702 ⁶¹	45.99 ¹¹⁹
15.9	16.95 ⁴⁸	71.85 ²⁸⁰	08.596 ¹²	52.38 ⁶⁰	35.763 ¹²	47.18 ¹⁰⁶
25.9	16.47 ⁵⁹	74.65 ²³⁸	08.608 ³²	52.98 ⁴⁸	35.775 ³⁹	48.24 ⁸⁹
35.9	15.88	77.03	08.576	53.46	35.736	49.13
Mean Place	13.383	78.80	02.376	31.61	29.064	25.97
Secd, Tanδ	3.728	- 3.591	1.175	+ 0.617	1.302	+ 0.834
a, a'	-1.0	+10.9	+3.8	+10.8	+4.0	+10.5
b, b'	-0.13	- 0.8	+0.02	- 0.8	+0.03	- 0.9
Authority and Catalogue No.	B.J.	234	B.J.	235	B.J.	238

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	γ Eridani		λ Tauri		A Tauri	
	3.19	K5	Var.	B3	4.50	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	$^h \ ^m$ 3 54	$^{\circ} \ ' \ ''$ -13 41	$^h \ ^m$ 3 57	$^{\circ} \ ' \ ''$ +12 18	$^h \ ^m$ 4 00	$^{\circ} \ ' \ ''$ +21 54
Jan. 0.9	61.627 ⁶⁴	29.54 ¹⁴⁹	06.536 ⁴²	37.45 ⁴⁷	52.973 ⁴²	31.35 ⁴
10.9	61.563 ⁹⁷	31.03 ¹²⁶	06.494 ⁷⁹	36.98 ⁴⁶	52.931 ⁸⁰	31.31 ⁹
20.8	61.466 ¹²⁷	32.29 ¹⁰¹	06.415 ¹⁰⁸	36.52 ⁴⁵	52.851 ¹¹⁴	31.22 ¹⁸
30.8	61.339 ¹⁵⁰	33.30 ⁷⁴	06.307 ¹³⁵	36.07 ⁴³	52.737 ¹³⁸	31.04 ²⁷
Feb. 9.8	61.189 ¹⁶⁶	34.04 ⁴⁵	06.172 ¹⁵²	35.64 ⁴²	52.599 ¹⁶⁰	30.77 ³⁴
19.8	61.023 ¹⁷³	34.49 ¹⁶	06.020 ¹⁶¹	35.22 ³⁸	52.439 ¹⁷⁰	30.43 ⁴²
Mar. 1.7	60.850 ¹⁷²	34.65 ¹⁴	05.859 ¹⁶¹	34.84 ³³	52.269 ¹⁷¹	30.01 ⁴⁸
11.7	60.678 ¹⁶⁰	34.51 ⁴⁴	05.698 ¹⁴⁸	34.51 ²⁸	52.098 ¹⁵⁶	29.53 ⁵⁰
21.7	60.518 ¹³⁹	34.07 ⁷³	05.550 ¹²⁸	34.23 ²⁰	51.942 ¹³⁴	29.03 ⁵²
31.6	60.379 ¹¹¹	33.34 ¹⁰⁰	05.422 ⁹⁸	34.03 ¹⁰	51.808 ¹⁰⁴	28.51 ⁴⁹
Apr. 10.6	60.268 ⁷⁶	32.34 ¹²⁷	05.324 ⁶¹	33.93 ³	51.704 ⁶⁵	28.02 ⁴⁴
20.6	60.192 ³⁴	31.07 ¹⁵³	05.263 ¹⁸	33.96 ¹⁷	51.639 ¹⁹	27.58 ³⁵
30.6	60.158 ¹⁰	29.54 ¹⁷⁴	05.245 ²⁸	34.13 ³³	51.620 ²⁸	27.23 ²³
May 10.5	60.168 ⁵⁶	27.80 ¹⁹⁴	05.273 ⁷⁴	34.46 ⁴⁹	51.648 ⁷⁶	27.00 ⁸
20.5	60.224 ¹⁰¹	25.86 ²⁰⁹	05.347 ¹²⁰	34.95 ⁶⁶	51.724 ¹²⁷	26.92 ⁷
30.5	60.325 ¹⁴⁴	23.77 ²²⁰	05.467 ¹⁶³	35.61 ⁸¹	51.851 ¹⁶⁹	26.99 ²⁵
June 9.5	60.469 ¹⁸⁴	21.57 ²²⁵	05.630 ²⁰³	36.42 ⁹⁶	52.020 ²¹¹	27.24 ⁴⁰
19.4	60.653 ²¹⁹	19.32 ²²⁶	05.833 ²³⁷	37.38 ¹⁰⁸	52.231 ²⁴⁸	27.64 ⁵⁸
29.4	60.872 ²⁴⁹	17.06 ²¹⁸	06.070 ²⁶⁴	38.46 ¹¹⁶	52.479 ²⁷⁸	28.22 ⁷⁰
July 9.4	61.121 ²⁷¹	14.88 ²⁰⁵	06.334 ²⁸⁶	39.62 ¹²²	52.757 ³⁰⁰	28.92 ⁸³
19.3	61.392 ²⁸⁷	12.83 ¹⁸⁶	06.620 ³⁰¹	40.84 ¹²³	53.057 ³¹⁷	29.75 ⁹³
29.3	61.679 ²⁹⁷	10.97 ¹⁶²	06.921 ³¹⁰	42.07 ¹²⁰	53.374 ³²⁶	30.68 ⁹⁵
Aug. 8.3	61.976 ³⁰¹	09.35 ¹³¹	07.231 ³¹¹	43.27 ¹¹⁴	53.700 ³²⁹	31.63 ⁹⁹
18.3	62.277 ²⁹⁹	08.04 ⁹⁶	07.542 ³⁰⁹	44.41 ¹⁰²	54.029 ³²⁵	32.62 ¹⁰⁰
28.2	62.576 ²⁹¹	07.08 ⁵⁸	07.851 ³⁰¹	45.43 ⁸⁹	54.354 ³¹⁹	33.62 ⁹³
Sept. 7.2	62.867 ²⁷⁸	06.50 ¹⁸	08.152 ²⁸⁹	46.32 ⁷³	54.673 ³⁰⁵	34.55 ⁸⁸
17.2	63.145 ²⁶³	06.32 ²²	08.441 ²⁷⁴	47.05 ⁵⁴	54.978 ²⁹⁴	35.43 ⁷⁸
27.2	63.408 ²⁴²	06.54 ⁶¹	08.715 ²⁵⁵	47.59 ³⁶	55.272 ²⁷³	36.21 ⁶⁹
Oct. 7.1	63.650 ²²⁰	07.15 ⁹⁸	08.970 ²³⁴	47.95 ¹⁸	55.545 ²⁵²	36.90 ⁵⁹
17.1	63.870 ¹⁹³	08.13 ¹²⁹	09.204 ²¹¹	48.13 ²	55.797 ²²⁸	37.49 ⁴⁹
27.1	64.063 ¹⁶⁶	09.42 ¹⁵⁵	09.415 ¹⁸⁵	48.15 ¹⁴	56.025 ²⁰¹	37.98 ⁴¹
Nov. 6.0	64.229 ¹³⁴	10.97 ¹⁷⁴	09.600 ¹⁵⁶	48.01 ²⁵	56.226 ¹⁷⁰	38.39 ³¹
16.0	64.363 ¹⁰²	12.71 ¹⁸⁶	09.756 ¹²⁵	47.76 ³⁶	56.396 ¹³⁸	38.70 ²³
25.9	64.465 ⁶⁷	14.57 ¹⁹¹	09.881 ⁹¹	47.40 ⁴²	56.534 ¹⁰²	38.93 ¹⁸
Dec. 5.9	64.532 ³⁰	16.48 ¹⁸⁷	09.972 ⁵⁴	46.98 ⁴⁶	56.636 ⁶²	39.11 ¹¹
15.9	64.562 ⁷	18.35 ¹⁷⁸	10.026 ¹⁷	46.52 ⁴⁸	56.698 ²³	39.22 ⁶
25.9	64.555 ⁴⁴	20.13 ¹⁶³	10.043 ²²	46.04 ⁴⁹	56.721 ¹⁵	39.28 ²
35.9	64.511	21.76	10.021	45.55	56.706	39.26
Mean Place	59.695	31.95	04.518	29.20	50.843	21.09
Secd, Tan δ	1.029	-0.244	1.024	+0.218	1.078	+0.402
a, a'	+2.8	+10.4	+3.3	+10.2	+3.5	+10.0
b, b'	-0.01	-0.9	+0.01	-0.9	+0.01	-0.9
Authority and Catalogue No.	B.J.	240	B.J.	241	A.E.	244

APPARENT PLACES OF STARS, 1935

385

AT UPPER TRANSIT AT GREENWICH

Name	43 Tauri		o ¹ Eridani		α Horologii	
Mag. Spect.	5.67	G5	4.14	F2	3.83	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 4 05	^m +19 26	^h 4 08	^m - 6 59	^h 4 11	^m -42 26
Jan. 0.9	24.609	29.65	43.392	76.68	52.925	75.45
10.9	24.573	29.51	43.346	77.99	52.794	77.78
20.8	24.499	29.32	43.265	79.12	52.620	79.70
30.8	24.391	29.08	43.152	80.06	52.409	81.18
Feb. 9.8	24.254	28.79	43.013	80.79	52.169	82.18
19.8	24.097	28.44	42.856	81.29	51.910	82.68
Mar. 1.7	23.930	28.06	42.689	81.56	51.640	82.68
11.7	23.763	27.64	42.521	81.59	51.372	82.18
21.7	23.607	27.20	42.362	81.38	51.116	81.21
31.6	23.471	26.78	42.221	80.93	50.883	79.78
Apr. 10.6	23.365	26.40	42.107	80.24	50.682	77.93
20.6	23.297	26.08	42.027	79.31	50.522	75.72
30.6	23.273	25.86	41.988	78.16	50.409	73.18
May 10.5	23.295	25.77	41.992	76.80	50.350	70.38
20.5	23.365	25.82	42.040	75.25	50.345	67.36
30.5	23.484	26.03	42.134	73.53	50.397	64.21
June 9.5	23.647	26.39	42.270	71.69	50.504	60.99
19.4	23.852	26.92	42.446	69.77	50.664	57.79
29.4	24.092	27.60	42.657	67.81	50.871	54.69
July 9.4	24.363	28.39	42.897	65.88	51.121	51.78
19.3	24.656	29.29	43.161	64.02	51.407	49.13
29.3	24.965	30.25	43.441	62.30	51.723	46.83
Aug. 8.3	25.285	31.25	43.734	60.78	52.059	44.94
18.3	25.608	32.25	44.031	59.49	52.408	43.54
28.2	25.929	33.22	44.328	58.49	52.761	42.67
Sept. 7.2	26.244	34.11	44.619	57.81	53.112	42.37
17.2	26.548	34.92	44.900	57.47	53.451	42.66
27.2	26.837	35.62	45.168	57.49	53.773	43.52
Oct. 7.1	27.108	36.20	45.417	57.85	54.069	44.93
17.1	27.358	36.66	45.646	58.55	54.335	46.85
27.1	27.586	37.00	45.853	59.53	54.566	49.21
Nov. 6.0	27.787	37.23	46.033	60.76	54.755	51.92
16.0	27.960	37.37	46.185	62.17	54.899	54.88
25.9	28.101	37.43	46.305	63.70	54.996	57.98
Dec. 5.9	28.205	37.43	46.392	65.29	55.043	61.11
15.9	28.272	37.38	46.442	66.88	55.039	64.14
25.9	28.299	37.29	46.454	68.40	54.984	66.99
35.9	28.285	37.15	46.429	69.82	54.880	69.55
Mean Place	22.489	20.10	41.413	80.51	50.722	72.99
Secd, Tanδ	1.060	+ 0.353	1.007	- 0.123	1.355	- 0.915
a, a'	+3.5	+ 9.6	+2.9	+ 9.4	+2.0	+ 9.1
b, b'	+0.01	- 0.9	0.00	- 0.9	-0.03	- 0.9
Authority and Catalogue No.	N.A.	249	B.J.	251	B.J.	256

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	α Reticuli		ν^4 Eridani <i>m.</i>		γ Tauri	
	3.36	G5	3.59	B9	3.86	K0
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 4 ^m 13	—62° 37'	^h 4 ^m 15	—33° 56'	^h 4 ^m 16	+15° 28'
Jan. 0.9	37.80	74.69	28.084	82.28	07.536	28.36
10.9	37.50	77.16	27.989	84.47	07.508	28.02
20.8	37.14	79.16	27.854	86.31	07.442	27.60
30.8	36.73	80.65	27.684	87.76	07.342	27.35
Feb. 9.8	36.27	81.58	27.486	88.77	07.212	27.00
19.8	35.79	81.95	27.268	89.34	07.060	26.65
Mar. 1.7	35.30	81.74	27.040	89.45	06.896	26.29
11.7	34.82	80.99	26.811	89.11	06.729	25.95
21.7	34.36	79.71	26.592	88.34	06.572	25.61
31.7	33.93	77.94	26.393	87.14	06.433	25.36
Apr. 10.6	33.56	75.73	26.223	85.55	06.321	25.15
20.6	33.24	73.13	26.090	83.61	06.245	25.03
30.6	32.99	70.20	26.000	81.36	06.211	25.02
May 10.5	32.82	67.01	25.959	78.84	06.222	25.14
20.5	32.73	63.62	25.968	76.11	06.280	25.40
30.5	32.72	60.12	26.027	73.22	06.385	25.81
June 9.5	32.81	56.60	26.138	70.25	06.535	26.38
19.4	32.97	53.13	26.294	67.27	06.725	27.08
29.4	33.21	49.82	26.494	64.35	06.951	27.90
July 9.4	33.52	46.74	26.731	61.58	07.207	28.82
19.4	33.90	43.99	27.000	59.04	07.487	29.82
29.3	34.33	41.65	27.294	56.79	07.785	30.85
Aug. 8.3	34.80	39.79	27.606	54.93	08.094	31.88
18.3	35.29	38.47	27.928	53.49	08.409	32.87
28.2	35.80	37.75	28.255	52.54	08.723	33.79
Sept. 7.2	36.31	37.66	28.578	52.11	09.032	34.60
17.2	36.81	38.20	28.891	52.23	09.332	35.28
27.2	37.28	39.37	29.189	52.89	09.619	35.82
Oct. 7.1	37.70	41.13	29.466	54.06	09.890	36.21
17.1	38.08	43.43	29.718	55.72	10.143	36.44
27.1	38.39	46.18	29.939	57.81	10.374	36.53
Nov. 6.1	38.63	49.29	30.126	60.23	10.580	36.49
16.0	38.79	52.64	30.274	62.90	10.758	36.35
25.9	38.87†	56.11	30.382†	65.72	10.905†	36.13
Dec. 5.9	38.86	59.57	30.447	68.58	11.017	35.85
15.9	38.77	62.91	30.467	71.38	11.092	35.53
25.9	38.59	66.00	30.441	74.02	11.128	35.19
35.9	38.34	68.75	30.370	76.42	11.123	34.85
Mean Place	34.899	70.15	25.984	81.18	05.413	20.00
Secδ, Tanδ	2.176	—1.932	1.205	—0.673	1.038	+0.277
<i>a</i> , <i>a'</i>	+0.8	+9.0	+2.3	+8.8	+3.4	+8.8
<i>b</i> , <i>b'</i>	—0.06	—0.9	—0.02	—0.9	+0.01	—0.9
Authority and Catalogue No.	B.J.	259	B.J.	261	A.N.	262

† Second transit, Nov. 25

† First transit, Nov. 26

APPARENT PLACES OF STARS, 1935

387

AT UPPER TRANSIT AT GREENWICH

Name	ε Tauri		α Tauri (<i>Aldebaran</i>)		α Doradus	
Mag. Spect.	3.63	Ko	1.06	K5	3.47	Aop
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 4 ^m 24	[°] +19 ['] 02	^h 4 ^m 32	[°] +16 ['] 22	^h 4 ^m 32	[°] -55 ['] 10
Jan. 0.9	51.224 ¹	24.99 ¹⁶	13.445 ¹⁴	56.57 ²⁹	37.911 ¹⁹⁰	46.31 ²⁶⁷
10.9	51.204 ²⁰	24.83 ¹⁸	13.431 ⁵⁶	56.28 ²⁹	37.721 ²⁴⁷	48.98 ²²⁴
20.9	51.143 ⁹⁸	24.65 ²¹	13.375 ⁹³	55.99 ³⁰	37.474 ²⁹⁷	51.22 ¹⁷⁷
30.8	51.045 ¹³⁰	24.44 ²⁵	13.282 ¹²⁶	55.69 ³⁰	37.177 ³³⁶	52.99 ¹²⁴
Feb. 9.8	50.915 ¹⁵⁴	24.19 ²⁹	13.156 ¹⁴⁹	55.39 ³¹	36.841 ³⁶³	54.23 ⁷⁰
19.8	50.761 ¹⁶⁷	23.90 ³²	13.007 ¹⁶⁶	55.08 ³²	36.478 ³⁷⁹	54.93 ¹⁶
Mar. 1.7	50.594 ¹⁷¹	23.58 ³⁵	12.841 ¹⁷⁰	54.76 ³¹	36.099 ³⁸¹	55.09 ⁴⁰
11.7	50.423 ¹⁶⁴	23.23 ³⁷	12.671 ¹⁶⁴	54.45 ³¹	35.718 ³⁶⁹	54.69 ⁹¹
21.7	50.259 ¹⁴⁶	22.86 ³⁶	12.507 ¹⁴⁸	54.14 ²⁸	35.349 ³⁴⁵	53.78 ¹⁴¹
31.7	50.113 ¹¹⁹	22.50 ³⁴	12.359 ¹³³	53.86 ²³	35.004 ³¹¹	52.37 ¹⁸⁸
Apr. 10.6	49.994 ⁸⁴	22.16 ²⁸	12.236 ⁸⁸	53.63 ¹⁶	34.693 ²⁶²	50.49 ²²⁸
20.6	49.910 ⁴¹	21.88 ²⁰	12.148 ⁴⁸	53.47 ⁷	34.431 ²⁰⁷	48.21 ²⁶⁵
30.6	49.869 ⁵	21.68 ⁹	12.100 ³	53.40 ⁵	34.224 ¹⁴⁵	45.56 ²⁹⁵
May 10.6	49.874 ⁵²	21.59 ⁴	12.097 ⁴⁴	53.45 ¹⁸	34.079 ⁷⁸	42.61 ³¹⁹
20.5	49.926 ¹⁰⁰	21.63 ¹⁸	12.141 ⁹⁰	53.63 ³¹	34.001 ⁹	39.42 ³³³
30.5	50.026 ¹⁴⁴	21.81 ³²	12.231 ¹³⁵	53.94 ⁴⁵	33.992 ⁶⁰	36.09 ³⁴³
June 9.5	50.170 ¹⁸⁷	22.13 ⁴⁶	12.366 ¹⁷⁷	54.39 ⁵⁸	34.052 ¹²⁹	32.66 ³⁴¹
19.4	50.357 ²²³	22.59 ⁶⁰	12.543 ²¹⁴	54.97 ⁷⁰	34.181 ¹⁹²	29.25 ³³²
29.4	50.580 ²⁵⁵	23.19 ⁷¹	12.757 ²⁴⁶	55.67 ⁸⁰	34.373 ²⁵²	25.93 ³¹³
July 9.4	50.835 ²⁸¹	23.90 ⁸⁰	13.003 ²⁷¹	56.47 ⁸⁷	34.625 ³⁰⁴	22.80 ²⁸⁶
19.4	51.116 ³⁰⁰	24.70 ⁸⁶	13.274 ²⁹¹	57.34 ⁹⁰	34.929 ³⁴⁸	19.94 ²⁴⁹
29.3	51.416 ³¹²	25.56 ⁸⁸	13.565 ³⁰⁵	58.24 ⁹¹	35.277 ³⁸⁴	17.45 ²⁰⁶
Aug. 8.3	51.728 ³¹⁹	26.44 ⁸⁸	13.870 ³¹¹	59.15 ⁸⁸	35.661 ⁴⁰⁸	15.39 ¹⁵⁵
18.3	52.047 ³²⁰	27.32 ⁸³	14.181 ³¹⁵	60.03 ⁸¹	36.069 ⁴²⁴	13.84 ⁹⁸
28.3	52.367 ³¹⁶	28.15 ⁷⁷	14.496 ³¹²	60.84 ⁷²	36.493 ⁴²⁸	12.86 ³⁸
Sept. 7.2	52.683 ³⁰⁹	28.92 ⁶⁸	14.808 ³⁰⁶	61.56 ⁵⁹	36.921 ⁴²¹	12.48 ²⁵
17.2	52.992 ²⁹⁷	29.60 ⁵⁶	15.114 ²⁹⁵	62.15 ⁴⁶	37.342 ⁴⁰⁵	12.73 ⁸⁹
27.2	53.289 ²⁸²	30.16 ⁴⁵	15.409 ²⁸¹	62.61 ³²	37.747 ³⁷⁶	13.62 ¹⁴⁸
Oct. 7.1	53.571 ²⁶⁵	30.61 ³³	15.690 ²⁶⁵	62.93 ¹⁸	38.123 ³⁴¹	15.10 ²⁰⁴
17.1	53.836 ²⁴³	30.94 ²¹	15.955 ²⁴⁵	63.11 ⁵	38.464 ²⁹⁶	17.14 ²⁵³
27.1	54.079 ²¹⁹	31.15 ¹²	16.200 ²²²	63.16 ⁷	38.760 ²⁴³	19.67 ²⁹⁴
Nov. 6.1	54.298 ¹⁹²	31.27 ³	16.422 ¹⁹⁵	63.09 ¹⁶	39.003 ¹⁸⁴	22.61 ³²²
16.0	54.490 ¹⁶⁰	31.30 ⁴	16.617 ¹⁶⁴	62.93 ²³	39.187 ¹¹⁹	25.83 ³⁴⁰
26.0	54.650 ¹²⁵	31.26 ⁸	16.781 ¹³⁰	62.70 ²⁸	39.306 ⁵¹	29.23 ³⁴⁵
Dec. 5.9	54.775 ⁸⁶	31.18 ¹¹	16.911 ⁹²	62.42 ³⁰	39.357 ¹⁷	32.68 ³³⁸
15.9	54.861 ⁴⁶	31.07 ¹⁴	17.003 ⁵¹	62.12 ³¹	39.340 ⁸⁷	36.06 ³²⁰
25.9	54.907 ³	30.93 ¹⁶	17.054 ⁹	61.81 ³²	39.253 ¹⁵²	39.26 ²⁹¹
35.9	54.910	30.77	17.063	61.49	39.101	42.17
Mean Place	49.025	16.26	11.248	48.63	35.322	43.28
Secδ, Tanδ	1.058	+ 0.345	1.042	+ 0.294	1.751	- 1.438
α, α'	+3.5	+ 8.1	+3.4	+ 7.5	+1.3	+ 7.5
δ, δ'	+0.01	- 0.9	+0.01	- 0.9	-0.04	- 0.9
Authority and Catalogue No.	B.J.	270	B.J.	278	B.J.	279

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	53 Eridani		τ Tauri		μ Eridani	
Mag. Spect.	3.98	Ko	4.33	B ₅	4.18	B ₅
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 4 ^m 35	[°] —14 ['] 25	^h 4 ^m 38	[°] +22 ['] 50	^h 4 ^m 42	[°] —3 ['] 22
Jan. 0.9	14.187	44.65	22.685	10.95	17.084	16.47
10.9	14.151 ³⁶	46.38 ¹⁷³	22.676 ⁹	11.00 ⁵	17.067 ¹⁷	17.75 ¹²⁸
20.9	14.076 ⁷⁵	47.88 ¹⁵⁰	22.623 ⁵³	11.01 ¹	17.011 ⁵⁶	18.89 ¹¹⁴
30.8	13.965 ¹¹¹	49.13 ¹²⁵	22.530 ⁹³	10.96 ⁵	16.918 ⁹³	19.85 ⁹⁶
Feb. 9.8	13.824 ¹⁴¹	50.11 ⁹⁸	22.402 ¹²⁸	10.85 ¹¹	16.793 ¹²⁵	20.63 ⁷⁸
	164	67	155	18	149	59
19.8	13.660	50.78	22.247	10.67	16.644	21.22
Mar. 1.8	13.482 ¹⁷⁸	51.15 ³⁷	22.076 ¹⁷¹	10.42 ²⁵	16.480 ¹⁶⁴	21.60 ³⁸
	183	6	178	33	171	17
11.7	13.299 ¹⁷⁸	51.21 ²⁴	21.898 ¹⁷³	10.09 ³⁹	16.309 ¹⁶⁷	21.77 ³
21.7	13.121 ¹⁶³	50.97 ⁵⁵	21.725 ¹⁵⁶	09.70 ⁴²	16.142 ¹⁵⁴	21.74 ²⁴
31.7	12.958 ¹³⁹	50.42 ⁸⁴	21.569 ¹³⁰	09.28 ⁴⁴	15.988 ¹³¹	21.50 ⁴⁶
Apr. 10.6	12.819 ¹⁰⁷	49.58 ¹¹¹	21.439 ⁹⁵	08.84 ⁴²	15.857 ¹⁰¹	21.04 ⁶⁷
20.6	12.712 ⁷⁰	48.47 ¹³⁸	21.344 ⁵⁴	08.42 ³⁸	15.756 ⁶³	20.37 ⁸⁷
30.6	12.642 ²⁸	47.09 ¹⁶²	21.290 ⁸	08.04 ³⁰	15.693 ²³	19.50 ¹⁰⁷
May 10.6	12.614 ¹⁶	45.47 ¹⁸³	21.282 ⁴⁰	07.74 ²⁰	15.670 ²¹	18.43 ¹²⁵
20.5	12.630 ⁶²	43.64 ¹⁹⁹	21.322 ⁸⁹	07.54 ⁸	15.691 ⁶⁵	17.18 ¹⁴¹
30.5	12.692 ¹⁰⁵	41.65 ²¹³	21.411 ¹³⁶	07.46 ⁵	15.756 ¹⁰⁹	15.77 ¹⁵⁴
June 9.5	12.797 ¹⁴⁷	39.52 ²²⁰	21.547 ¹⁷⁹	07.51 ¹⁹	15.865 ¹⁴⁸	14.23 ¹⁶⁴
19.5	12.944 ¹⁸⁵	37.32 ²²³	21.726 ²¹⁷	07.70 ³³	16.013 ¹⁸⁶	12.59 ¹⁷⁰
29.4	13.129 ²¹⁷	35.09 ²¹⁷	21.943 ²⁵¹	08.03 ⁴⁴	16.199 ²¹⁸	10.89 ¹⁷¹
July 9.4	13.346 ²⁴⁴	32.92 ²⁰⁷	22.194 ²⁷⁹	08.47 ⁵⁵	16.417 ²⁴⁴	09.18 ¹⁶⁶
19.4	13.590 ²⁶⁷	30.85 ¹⁹⁰	22.473 ²⁹⁹	09.02 ⁶³	16.661 ²⁶⁵	07.52 ¹⁵⁶
29.3	13.857 ²⁸²	28.95 ¹⁶⁶	22.772 ³¹⁵	09.65 ⁶⁸	16.926 ²⁸⁰	05.96 ¹⁴²
Aug. 8.3	14.139 ²⁹²	27.29 ¹³⁸	23.087 ³²³	10.33 ⁷¹	17.206 ²⁹⁰	04.54 ¹²¹
18.3	14.431 ²⁹⁶	25.91 ¹⁰³	23.410 ³²⁷	11.04 ⁷⁰	17.496 ²⁹⁴	03.33 ⁹⁷
28.3	14.727 ²⁹⁵	24.88 ⁶⁵	23.737 ³²⁵	11.74 ⁶⁷	17.790 ²⁹⁴	02.36 ⁶⁸
Sept. 7.2	15.022 ²⁹⁰	24.23 ²⁵	24.062 ³²⁰	12.41 ⁶²	18.084 ²⁸⁹	01.68 ³⁷
17.2	15.312 ²⁷⁹	23.98 ¹⁸	24.382 ³¹⁰	13.03 ⁵⁵	18.373 ²⁸⁰	01.31 ²⁸
27.2	15.591 ²⁶⁶	24.16 ⁵⁸	24.692 ²⁹⁷	13.58 ⁴⁷	18.653 ²⁶⁸	01.26 ⁵
Oct. 7.2	15.857 ²⁴⁸	24.74 ⁹⁸	24.989 ²⁸¹	14.05 ³⁹	18.921 ²⁵³	01.54 ⁵⁸
17.1	16.105 ²²⁶	25.72 ¹³³	25.270 ²⁶¹	14.44 ³⁰	19.174 ²³³	02.12 ⁸⁷
27.1	16.331 ²⁰²	27.05 ¹⁶²	25.531 ²³⁸	14.74 ²⁴	19.407 ²¹¹	02.99 ¹¹¹
Nov. 6.1	16.533 ¹⁷³	28.67 ¹⁸⁵	25.769 ²¹⁰	14.98 ¹⁹	19.618 ¹⁸⁵	04.10 ¹³⁰
16.0	16.706 ¹⁴⁰	30.52 ²⁰⁰	25.979 ¹⁷⁸	15.17 ¹⁵	19.803 ¹⁵⁵	05.40 ¹⁴³
26.0	16.846 ¹⁰⁶	32.52 ²⁰⁸	26.157 ¹⁴³	15.32 ¹¹	19.958 ¹²²	06.83 ¹⁴⁹
Dec. 5.9	16.952 ⁶⁷	34.60 ²⁰⁷	26.300 ¹⁰³	15.43 ⁹	20.080 ⁸⁵	08.32 ¹⁵¹
15.9	17.019 ²⁸	36.67 ²⁰⁰	26.403 ⁶¹	15.52 ⁷	20.165 ⁴⁶	09.83 ¹⁴⁷
25.9	17.047 ¹³	38.67 ¹⁸⁶	26.464 ¹⁵	15.59 ⁵	20.211 ⁵	11.30 ¹³⁷
35.9	17.034	40.53	26.479	15.64	20.216	12.67
Mean Place	12.133	47.04	20.381	02.14	14.998	20.68
Secd, Tan δ	1.033	—0.257	1.085	+0.421	1.002	—0.059
a, a'	+2.8	+7.2	+3.6	+7.0	+3.0	+6.7
b, b'	—0.01	—0.9	+0.01	—0.9	0.00	—0.9
Authority and Catalogue No.	B.J.	282	B.J.	284	A.N.	288

APPARENT PLACES OF STARS, 1935

389

AT UPPER TRANSIT AT GREENWICH

Name	π^3 Orionis		9 Camelopardi		Aurigæ	
	3.31	F8	4.38	Bo	2.90	K2
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 4 46	^m + 6 50	^h 4 47	^m + 66 14	^h 4 52	^m + 33 03
Jan. 0.9	20.692	63.45 80	38.95	19.95 223	47.917	63.67 61
10.9	20.687 5	62.65 72	38.86 9	22.18 197	47.918 1	64.28 52
20.9	20.640 47	61.93 63	38.67 19	24.15 161	47.870 48	64.80 52
30.8	20.556 84	61.30 53	38.39 28	25.76 120	47.775 95	65.20 40
Feb. 9.8	20.439 117	60.77 44	38.04 35	26.96 73	47.639 136	65.46 26
19.8	20.296 143	60.33 34	37.63 41	27.69 120	47.472 167	65.55 9
Mar. 1.8	20.137 159	59.99 24	37.18 45	27.94 25	47.283 189	65.46 9
11.7	19.970 167	59.75 12	36.73 45	27.70 24	47.085 198	65.19 27
21.7	19.806 164	59.63 12	36.28 45	26.97 73	46.890 195	64.76 43
31.7	19.655 151	59.62 11	35.87 41	25.80 117	46.710 180	64.17 59
Apr. 10.6	19.527 128	59.73 25	35.52 35	24.23 157	46.557 153	63.47 70
20.6	19.430 97	59.98 25	35.24 28	22.34 189	46.440 117	62.68 79
30.6	19.370 60	60.37 39	35.04 20	20.20 214	46.367 73	61.86 82
May 10.6	19.351 19	60.91 54	34.95 9	17.90 230	46.343 24	61.03 83
20.5	19.377 26	61.60 69	34.95 12	15.52 238	46.371 28	60.25 78
30.5	19.447 70	62.43 83	35.07 12	13.13 239	46.451 80	59.55 70
June 9.5	19.561 114	63.40 97	35.28 21	10.82 231	46.583 132	58.95 60
19.5	19.716 155	64.47 107	35.59 31	08.65 217	46.763 180	58.48 47
29.4	19.908 192	65.63 116	36.00 41	06.68 197	46.986 223	58.15 33
July 9.4	20.132 224	66.84 121	36.47 47	04.97 171	47.247 261	57.97 18
19.4	20.383 251	68.07 123	37.02 55	03.54 143	47.540 293	57.94 3
29.3	20.653 270	69.26 119	37.62 60	02.44 110	47.857 317	58.05 11
Aug. 8.3	20.940 287	70.38 112	38.26 64	01.68 76	48.193 336	58.28 23
18.3	21.236 296	71.39 101	38.92 66	01.28 40	48.542 349	58.62 34
28.3	21.537 301	72.24 85	39.61 69	01.22 6	48.897 355	59.05 43
Sept. 7.2	21.838 301	72.91 67	40.30 69	01.52 30	49.253 356	59.54 49
17.2	22.134 296	73.36 45	40.99 69	02.17 65	49.606 353	60.09 55
27.2	22.422 288	73.59 23	41.66 67	03.15 98	49.951 345	60.67 58
Oct. 7.2	22.700 278	73.58 1	42.31 65	04.45 130	50.285 334	61.28 61
17.1	22.962 262	73.35 23	42.92 61	06.04 159	50.603 318	61.90 62
27.1	23.206 244	72.91 44	43.49 57	07.91 187	50.901 298	62.55 65
Nov. 6.1	23.428 222	72.30 61	44.00 51	10.01 210	51.175 274	63.20 65
16.0	23.626 198	71.54 76	44.44 44	12.30 229	51.421 246	63.87 67
26.0	23.795 169	70.69 85	44.80 36	14.74 244	51.632 211	64.56 69
Dec. 5.9	23.930 135	69.78 91	45.08 28	17.27 253	51.805 173	65.26 70
15.9	24.028 98	68.86 92	45.25 17	19.82 255	51.933 128	65.95 69
25.9	24.087 59	67.96 90	45.33 8	22.30 248	52.013 80	66.62 67
35.9	24.105 18	67.10 86	45.30 3	24.65 235	52.043 30	67.25 63
Mean Place	18.538	57.62	34.403	06.01	45.360	54.06
Sec δ , Tan δ	1.007	+ 0.120	2.481	+ 2.271	1.193	+ 0.651
a, a'	+3.2	+ 6.3	+6.0	+ 6.2	+3.9	+ 5.8
b, b'	0.00	- 0.9	+0.05	- 1.0	+0.01	- 1.0
Authority and Catalogue No.	A.N.	291	B.J.	293	B.J.	299

† Second transit, Dec. 5

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ε Aurigæ		ι Tauri		η Aurigæ	
	Var.		4.70		3.28	
	F5p		A5		B3	
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 4 57	^m +43 43	^h 4 59	^m +21 29	^h 5 01	^m +41 08
Jan. 0.9	20.864	55.66	14.761	63.17	59.930	64.69
10.9	20.863	56.85	14.771	63.14	59.937	65.75
20.9	20.803	57.90	14.735	63.10	59.887	66.69
30.8	20.689	58.75	14.656	63.05	59.784	67.46
Feb. 9.8	20.528	59.38	14.540	62.96	59.634	68.03
19.8	20.329	59.74	14.394	62.83	59.448	68.36
Mar. 1.8	20.106	59.81	14.227	62.64	59.236	68.44
11.7	19.871	59.60	14.049	62.40	59.012	68.26
21.7	19.638	59.11	13.873	62.11	58.790	67.82
31.7	19.423	58.36	13.710	61.79	58.583	67.15
Apr. 10.7	19.238	57.39	13.569	61.46	58.403	66.28
20.6	19.093	56.24	13.460	61.13	58.262	65.25
30.6	18.999	54.97	13.390	60.84	58.168	64.11
May 10.6	18.960	53.64	13.363	60.61	58.128	62.90
20.5	18.981	52.30	13.383	60.46	58.144	61.69
30.5	19.062	50.99	13.451	60.42	58.219	60.52
June 9.5	19.202	49.77	13.565	60.48	58.349	59.43
19.5	19.397	48.68	13.723	60.66	58.534	58.46
29.4	19.642	47.75	13.919	60.96	58.766	57.63
July 9.4	19.931	46.98	14.151	61.36	59.041	56.97
19.4	20.259	46.41	14.412	61.84	59.353	56.48
29.4	20.616	46.04	14.697	62.38	59.695	56.16
Aug. 8.3	20.996	45.86	14.998	62.96	60.059	56.02
18.3	21.391	45.87	15.312	63.55	60.438	56.05
28.3	21.796	46.07	15.632	64.12	60.827	56.24
Sept. 7.2	22.204	46.43	15.954	64.64	61.220	56.57
17.2	22.609	46.94	16.274	65.10	61.611	57.02
27.2	23.006	47.60	16.588	65.47	61.995	57.60
Oct. 7.2	23.391	48.39	16.892	65.76	62.369	58.28
17.1	23.759	49.29	17.182	65.96	62.726	59.06
27.1	24.105	50.31	17.457	66.08	63.063	59.93
Nov. 6.1	24.423	51.42	17.710	66.13	63.375	60.89
16.1	24.707	52.62	17.938	66.12	63.655	61.92
26.0	24.952	53.89	18.135	66.09	63.897	63.01
Dec. 6.0	25.150†	55.20	18.299†	66.04	64.095	64.15
15.9	25.297	56.53	18.423	65.99	64.245	65.31
25.9	25.388	57.83	18.504	65.94	64.341	66.46
35.9	25.420	59.07	18.539	65.89	64.379	67.55
Mean Place	17.962	44.95	12.403	55.58	57.100	54.64
Secδ, Tanδ	1.384	+ 0.957	1.075	+ 0.394	1.328	+ 0.874
a, a'	+4.3	+ 5.4	+3.6	+ 5.3	+4.2	+ 5.0
b, b'	+0.02	- 1.0	+0.01	- 1.0	+0.01	- 1.0
Authority and Catalogue No.	B.J.	301	B.J.	305	B.J.	307

† First transit, Dec. 6

APPARENT PLACES OF STARS, 1935

391

AT UPPER TRANSIT AT GREENWICH

Name	ε Leporis		β Eridani		μ Leporis	
Mag. Spect.	3.29	K ₅	2.92	A ₃	3.30	A _{0p}
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 5 02	^m —22 27	^h 5 04	^m — 5 09	^h 5 10	^m —16 16
Jan. 0.9	44.586	24.23	41.271	64.96	02.668	49.99
10.9	44.559	26.42	41.271	66.41	02.658	51.97
20.9	44.489	28.35	41.228	67.70	02.605	53.74
30.9	44.379	29.98	41.145	68.80	02.512	55.24
Feb. 9.8	44.234	31.28	41.028	69.70	02.383	56.45
19.8	44.061	32.22	40.884	70.38	02.226	57.34
Mar. 1.8	43.869	32.78	40.719	70.84	02.049	57.92
11.7	43.668	32.97	40.545	71.08	01.860	58.17
21.7	43.468	32.79	40.371	71.09	01.672	58.10
31.7	43.279	32.24	40.208	70.87	01.493	57.70
Apr. 10.7	43.110	31.34	40.064	70.43	01.333	56.99
20.6	42.970	30.11	39.947	69.77	01.199	55.99
30.6	42.866	28.57	39.866	68.90	01.100	54.71
May 10.6	42.803	26.75	39.823	67.82	01.040	53.17
20.6	42.783	24.69	39.823	66.55	01.023	51.40
30.5	42.809	22.43	39.866	65.12	01.050	49.45
June 9.5	42.880	20.03	39.952	63.55	01.121	47.35
19.5	42.995	17.55	40.079	61.89	01.234	45.15
29.4	43.150	15.05	40.243	60.17	01.386	42.92
July 9.4	43.342	12.59	40.441	58.44	01.574	40.71
19.4	43.566	10.25	40.668	56.75	01.793	38.59
29.4	43.817	08.11	40.918	55.16	02.037	36.63
Aug. 8.3	44.089	06.24	41.186	53.73	02.302	34.89
18.3	44.376	04.69	41.467	52.51	02.582	33.44
28.3	44.673	03.53	41.756	51.55	02.872	32.32
Sept. 7.3	44.974	02.80	42.048	50.88	03.166	31.59
17.2	45.274	02.54	42.339	50.53	03.461	31.28
27.2	45.568	02.77	42.624	50.53	03.751	31.41
Oct. 7.2	45.853	03.48	42.901	50.88	04.032	31.97
17.1	46.122	04.64	43.166	51.55	04.301	32.95
27.1	46.372	06.22	43.414	52.53	04.553	34.31
Nov. 6.1	46.598	08.16	43.642	53.76	04.783	36.01
16.1	46.795	10.38	43.846	55.20	04.987	37.98
26.0	46.960	12.80	44.021	56.79	05.161	40.13
Dec. 6.0	47.088	15.34	44.163	58.46	05.299	42.39
15.9	47.174	17.88	44.268	60.14	05.400	44.67
25.9	47.218	20.36	44.333	61.78	05.458	46.90
35.9	47.217	22.69	44.356	63.33	05.473	49.01
Mean Place	42.455	25.65	39.135	68.60	00.538	52.20
Secδ, Tanδ	1.082	— 0.413	1.004	— 0.090	1.042	— 0.292
a, a'	+2.5	+ 5.0	+3.0	+ 4.8	+2.7	+ 4.3
b, b'	—0.01	— 1.0	0.00	— 1.0	0.00	— 1.0
Authority and Catalogue No.	B.J.	308	B.J.	310	A.N.	316

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	β Orionis (<i>Rigel</i>)		α Aurigæ (<i>Capella</i>)		σ Orionis	
	0.34 B8p		0.21 G0		4.65 B3	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
Mean Solar Date						
	^h 5 ^m 11	— ^s 8 16	^h 5 ^m 11	+45° 56'	^h 5 ^m 18	— ^s 0 26
Jan. 0.9	26.887	28.07	56.064	12.41	28.699	38.50
10.9	26.889 ²	29.69 ¹⁶²	56.079 ¹⁵	13.73 ¹³²	28.714 ¹⁵	39.76 ¹²⁶
20.9	26.847 ⁴²	31.14 ¹⁴⁵	56.031 ⁴⁸	14.92 ¹¹⁹	28.686 ²⁸	40.88 ¹¹²
30.9	26.766 ⁸¹	32.38 ¹²⁴	55.924 ¹⁰⁷	15.94 ¹⁰²	28.616 ⁷⁰	41.86 ⁹⁸
Feb. 9.8	26.649 ¹¹⁷	33.39 ¹⁰¹	55.766 ¹⁵⁸	16.73 ⁷⁹	28.511 ¹⁰⁵	42.66 ⁸⁰
19.8	26.504 ¹⁴⁵	34.15 ⁷⁶	55.566 ²⁰⁰	17.25 ⁵²	28.375 ¹³⁶	43.28 ⁶²
Mar. 1.8	26.338 ¹⁶⁶	34.66 ⁵¹	55.336 ²³⁰	17.47 ²²	28.217 ¹⁵⁸	43.72 ⁴⁴
11.7	26.161 ¹⁷⁷	34.92 ²⁶	55.091 ²⁴⁵	17.39 ⁸	28.047 ¹⁷⁰	43.99 ²⁷
21.7	25.983 ¹⁷⁸	34.92 [—]	54.846 ²⁴⁵	17.00 ³⁹	27.875 ¹⁷²	44.06 ⁷
31.7	25.815 ¹⁶⁸	34.67 ²⁵	54.614 ²³²	16.33 ⁶⁷	27.710 ¹⁶⁵	43.96 ¹⁰
Apr. 10.7	25.664 ¹⁵¹	34.17 ⁵⁰	54.409 ²⁰⁵	15.40 ⁹³	27.563 ¹⁴⁷	43.67 ²⁹
20.6	25.541 ¹²³	33.43 ⁷⁴	54.245 ¹⁶⁴	14.26 ¹¹⁴	27.443 ¹²⁰	43.21 ⁴⁶
30.6	25.452 ⁸⁹	32.45 ⁹⁸	54.130 ¹¹⁵	12.96 ¹³⁰	27.355 ⁸⁸	42.56 ⁶⁵
May 10.6	25.401 ⁵¹	31.25 ¹²⁰	54.071 ⁵⁹	11.57 ¹³⁹	27.306 ⁴⁹	41.74 ⁸²
20.6	25.393 ⁸	29.86 ¹³⁹	54.073 ²	10.12 ¹⁴⁵	27.298 ⁸	40.75 ⁹⁹
30.5	25.427 ³⁴	28.29 ¹⁵⁷	54.136 ⁶³	08.68 ¹⁴⁴	27.333 ³⁵	39.60 ¹¹⁵
June 9.5	25.504 ⁷⁷	26.58 ¹⁷¹	54.260 ¹²⁴	07.29 ¹³⁹	27.410 ⁷⁷	38.33 ¹²⁷
19.5	25.623 ¹¹⁹	24.77 ¹⁸¹	54.442 ¹⁸²	06.01 ¹²⁸	27.529 ¹¹⁹	36.96 ¹³⁷
29.4	25.779 ¹⁵⁶	22.91 ¹⁸⁶	54.677 ²³⁵	04.86 ¹¹⁵	27.685 ¹⁵⁶	35.52 ¹⁴⁴
July 9.4	25.969 ¹⁹⁰	21.05 ¹⁸⁶	54.960 ²⁸³	03.87 ⁹⁹	27.876 ¹⁹¹	34.06 ¹⁴⁶
19.4	26.189 ²²⁰	19.25 ¹⁸⁰	55.283 ³²³	03.06 ⁸¹	28.096 ²²⁰	32.61 ¹⁴⁵
29.4	26.434 ²⁴⁵	17.55 ¹⁷⁰	55.640 ³⁵⁷	02.44 ⁶²	28.340 ²⁴⁴	31.23 ¹³⁸
Aug. 8.3	26.697 ²⁶³	16.04 ¹⁵¹	56.023 ³⁸³	02.02 ⁴²	28.603 ²⁶³	29.98 ¹²⁵
18.3	26.975 ²⁷⁸	14.75 ¹²⁹	56.425 ⁴⁰²	01.79 ²³	28.880 ²⁷⁷	28.89 ¹⁰⁹
28.3	27.262 ²⁸⁷	13.74 ¹⁰¹	56.839 ⁴¹⁴	01.76 ³	29.167 ²⁸⁷	28.01 ⁸⁸
Sept. 7.3	27.553 ²⁹¹	13.05 ⁶⁹	57.260 ⁴²¹	01.91 ¹⁵	29.459 ²⁹²	27.39 ⁶²
17.2	27.845 ²⁹²	12.71 ³⁴	57.681 ⁴²¹	02.23 ³²	29.752 ²⁹³	27.05 ³⁴
27.2	28.132 ²⁸⁷	12.74 ³	58.098 ⁴¹⁷	02.72 ⁴⁹	30.041 ²⁸⁹	27.01 ⁴
Oct. 7.2	28.411 ²⁷⁹	13.15 ⁴¹	58.504 ⁴⁰⁶	03.36 ⁶⁴	30.325 ²⁸⁴	27.27 ²⁶
17.1	28.679 ²⁶⁸	13.92 ⁷⁷	58.896 ³⁹²	04.15 ⁷⁹	30.598 ²⁷³	27.82 ⁵⁵
27.1	28.931 ²⁵²	15.01 ¹⁰⁹	59.266 ³⁷⁰	05.08 ⁹³	30.857 ²⁵⁹	28.64 ⁸²
Nov. 6.1	29.163 ²³²	16.39 ¹³⁸	59.610 ³⁴⁴	06.14 ¹⁰⁶	31.097 ²⁴⁰	29.69 ¹⁰⁵
16.1	29.371 ²⁰⁸	17.99 ¹⁶⁰	59.922 ³¹²	07.31 ¹¹⁷	31.316 ²¹⁹	30.93 ¹²⁴
26.0	29.551 ¹⁸⁰	19.75 ¹⁷⁶	60.193 ²⁷¹	08.59 ¹²⁸	31.507 ¹⁹¹	32.30 ¹³⁷
Dec. 6.0	29.697 ¹⁴⁶	21.60 ¹⁸⁵	60.417 ²²⁴	09.95 ¹³⁶	31.666 ¹⁵⁹	33.75 ¹⁴⁵
15.9	29.806 ¹⁰⁹	23.48 ¹⁸⁸	60.588 ¹⁷¹	11.35 ¹⁴⁰	31.788 ¹²²	35.21 ¹⁴⁶
25.9	29.875 ⁶⁹	25.31 ¹⁸³	60.700 ¹¹²	12.75 ¹³⁶	31.871 ⁸³	36.63 ¹⁴²
35.9	29.901 ²⁶	27.04 ¹⁷³	60.750 ⁵⁰	14.11 ¹³⁶	31.911 ⁴⁰	37.98 ¹³⁵
Mean Place	24.746	31.23	52.999	02.58	26.513	42.50
Secδ, Tanδ	1.011	— 0.145	1.438	+ 1.033	1.000	— 0.008
α, α'	+2.9	+ 4.2	+4.4	+ 4.2	+3.1	+ 3.6
δ, δ'	0.00	— 1.0	+0.01	— 1.0	0.00	— 1.0
Authority and Catalogue No.	B.J.	318	B.J.	319	N.A.	327

APPARENT PLACES OF STARS, 1935

393

AT UPPER TRANSIT AT GREENWICH

Name	η Orionis <i>m.</i>		γ Orionis (<i>Bellatrix</i>)		β Tauri	
Mag. Spect.	3.44	B1	1.70	B2	1.78	B8
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 5 ^m 21	— 2° 27'	^h 5 ^m 21	+ 6° 17'	^h 5 ^m 22	+ 28° 33'
Jan. 0.9	14.564	16.36	40.797	37.35	13.371	22.69
10.9	14.580 ¹⁶ / ₂₇	17.73 ¹³⁷ / ₁₂₄	40.820 ²³ / ₂₁	36.44 ⁹¹ / ₈₀	13.404 ³³ / ₁₉	23.06 ³⁷ / ₃₄
20.9	14.553 ⁶⁹ / ₁₀₆	18.97 ¹⁰⁶ / ₈₇	40.799 ⁶³ / ₁₀₁	35.64 ⁷⁰ / ₅₈	13.385 ⁶⁶ / ₁₁₀	23.40 ³⁰ / ₂₃
30.9	14.484 ¹⁰⁶ / ₁₃₆	20.03 ⁸⁷ / ₆₈	40.736 ¹⁰¹ / ₁₃₂	34.94 ⁵⁸ / ₄₇	13.319 ¹¹⁰ / ₁₄₆	23.70 ¹² / ₁₃
Feb. 9.8	14.378	20.90	40.635	34.36	13.209	23.92
19.8	14.242	21.58	40.503	33.89	13.063	24.05
Mar. 1.8	14.084 ¹⁵⁸ / ₁₇₁	22.06 ⁴⁸ / ₂₇	40.348 ¹⁵⁵ / ₁₆₉	33.54 ³⁵ / ₂₄	12.891 ¹⁷² / ₁₈₈	24.07 ² / ₁₁
11.8	13.913 ¹⁷⁴ / ₁₆₆	22.33 ⁷ / ₁₂	40.179 ¹⁷¹ / ₁₆₃	33.30 ¹² / ₁	12.703 ¹⁹⁰ / ₁₈₂	23.96 ²³ / ₃₅
21.7	13.739	22.40	40.008	33.18	12.513	23.73
31.7	13.573 ¹⁴⁹ / ₃₃	22.28	39.845 ¹⁴⁶ / ₁₁	33.17	12.331 ¹⁶¹ / ₄₄	23.38
Apr. 10.7	13.424 ¹²³ / ₉₁	21.95 ⁵² / ₇₂	39.699 ¹¹⁹ / ₈₆	33.28 ²⁴ / ₃₇	12.170 ¹³¹ / ₉₃	22.94 ⁵¹ / ₅₅
20.6	13.301	21.43	39.580	33.52	12.039	22.43
30.6	13.210	20.71	39.494	33.89	11.946	21.88
May 10.6	13.157 ⁵³ / ₁₂	19.80 ⁹¹ / ₁₀₈	39.446 ⁴⁸ / ₆	34.39 ⁵⁰ / ₆₄	11.898 ⁴⁸ / ₂	21.32 ⁵⁶ / ₄₈
20.6	13.145 ³¹ / ₁₂₄	18.72	39.440 ³⁸ / ₁₂₄	35.03	11.896	20.78
30.5	13.176	17.48	39.478	35.80	11.944	20.30
June 9.5	13.250 ⁷⁴ / ₁₁₄	16.11 ¹³⁷ / ₁₄₇	39.558 ⁸⁰ / ₁₂₂	36.69 ⁸⁹ / ₉₉	12.041 ⁹⁷ / ₁₄₃	19.88 ⁴² / ₃₂
19.5	13.364 ¹⁵² / ₁₈₇	14.64 ¹⁵⁴ / ₁₅₆	39.680 ¹⁶⁰ / ₁₉₄	37.68 ¹⁰⁸ / ₁₁₀	12.184 ¹⁸⁵ / ₂₂₄	19.56 ²² / ₁₂
29.5	13.516	13.10	39.840	38.76	12.369	19.34
July 9.4	13.703 ²¹⁶ / ₁₄₅	11.54 ¹⁵² / ₁₄₅	40.034 ²²³ / ₂₄₇	39.86 ¹¹² / ₁₀₉	12.593 ²⁵⁷ / ₂₈₄	19.22 ² / ₇
19.4	13.919	10.02	40.257	40.98	12.850	19.20
29.4	14.160 ²⁴¹ / ₂₆₁	08.57 ¹⁴⁵ / ₁₃₂	40.504 ²⁴⁷ / ₂₆₇	42.07 ¹⁰⁹ / ₁₀₁	13.134 ²⁸⁴ / ₃₀₆	19.27 ¹⁵ / ₂₀
Aug. 8.3	14.421	07.25 ¹¹³ / ₉₁	40.771 ²⁸¹ / ₂₉₀	43.08 ⁸⁸ / ₇₄	13.440 ³⁰⁶ / ₃₂₁	19.42 ¹⁵ / ₂₀
18.3	14.696 ²⁷⁵ / ₂₈₅	06.12 ¹¹³ / ₉₁	41.052 ²⁸¹ / ₂₉₀	43.96 ⁸⁸ / ₇₄	13.761 ³²¹ / ₃₃₂	19.62 ²⁰ / ₂₄
28.3	14.981 ²⁸⁵ / ₂₉₁	05.21 ⁹¹ / ₆₄	41.342 ²⁹⁰ / ₂₉₆	44.70 ⁷⁴ / ₅₄	14.093 ³³² / ₃₃₈	19.86 ²⁴ / ₂₇
Sept. 7.3	15.272 ²⁹² / ₂₈₉	04.57 ³³ / ₂	41.638 ²⁹⁸ / ₂₉₄	45.24 ³³ / ₉	14.431 ³⁴⁰ / ₃₃₆	20.13 ²⁶ / ₂₆
17.2	15.564	04.24	41.936	45.57	14.771	20.39
27.2	15.853 ²⁸³ / ₂₈₃	04.22 ³⁰ / ₃₀	42.230 ²⁹⁴ / ₂₈₉	45.66 ¹⁵ / ₁₅	15.107 ³³⁶ / ₃₃₁	20.65 ²⁴ / ₂₄
Oct. 7.2	16.136	04.52 ⁶¹ / ₉₀	42.519 ²⁷⁹ / ₂₆₇	45.51 ³⁷ / ₅₉	15.438 ³²¹ / ₃₀₆	20.89 ²³ / ₂₂
17.2	16.409	05.13	42.798	45.14	15.759	21.12
27.1	16.669	06.03 ¹¹⁴ / ₁₁₄	43.065 ²⁴⁸ / ₂₂₇	44.55 ⁷⁷ / ₉₂	16.065 ²⁸⁷ / ₂₆₂	21.34 ²² / ₂₃
Nov. 6.1	16.910 ²⁴¹ / ₂₁₉	07.17 ¹³⁵ / ₁₄₈	43.313 ²²⁷ / ₂₀₀	43.78 ⁹² / ₁₀₁	16.352 ²⁶² / ₂₃₃	21.56 ²³ / ₂₅
16.1	17.129	08.52	43.540	42.86	16.614	21.79
26.0	17.321 ¹⁹² / ₁₆₀	10.00 ¹⁵⁷ / ₁₅₉	43.740 ¹⁶⁸ / ₁₃₂	41.85 ¹⁰⁷ / ₁₀₇	16.847 ²³³ / ₁₉₈	22.04 ²⁸ / ₃₁
Dec. 6.0	17.481 ¹²³ / ₈₃	11.57 ¹⁵⁹ / ₁₅₄	43.908 ¹³² / ₉₁	40.78 ¹⁰⁷ / ₁₀₄	17.045 ¹⁵⁶ / ₁₁₀	22.32 ³¹ / ₃₄
15.9	17.604	13.16	44.040 ⁹¹ / ₄₉	39.71 ¹⁰⁴ / ₉₇	17.201 ¹¹⁰ / ₆₁	22.63 ³⁴ / ₃₅
25.9	17.687	14.70	44.131	38.67	17.311	22.97
35.9	17.728	16.16	44.180	37.70	17.372	23.32
Mean Place	12.385	20.09	38.557	32.66	10.812	15.50
Sec δ , Tan δ	1.001	— 0.043	1.006	+ 0.110	1.138	+ 0.544
<i>a</i> , <i>a'</i>	+3.0	+ 3.4	+3.2	+ 3.3	+3.8	+ 3.3
<i>b</i> , <i>b'</i>	0.00	— 1.0	0.00	— 1.0	+0.01	— 1.0
Authority and Catalogue No.	A.N.	328	B.J.	330	B.J.	331

(330/3544)

(NAUTICAL ALMANAC, 1935)

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APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	β Leporis		20 G Pictoris		δ Orionis	
	2.96	Go	5.54	G5	2.48	Bo
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 5 25	^m —20 48	^h 5 28	^m —47 06	^h 5 28	^m —0 20
Jan. 0.9	29.649	34.14 ²²⁵	24.575	84.94 ³⁰⁷	43.248	40.81 ¹²⁸
10.9	29.646	36.39 ²⁰²	24.505	88.01 ²⁷⁵	43.272	42.09 ¹¹⁵
20.9	29.597	38.41 ¹⁷⁴	24.375	90.76 ²³⁷	43.252	43.24 ¹⁰⁰
30.9	29.506	40.15 ¹⁴³	24.192	93.13 ¹⁹³	43.190	44.24 ⁸²
Feb. 9.8	29.377	41.58 ¹⁰⁸	23.962	95.06 ¹⁴⁴	43.090	45.06 ⁶⁴
19.8	29.217	42.66 ⁷²	23.694	96.50 ⁹⁴	42.958	45.70 ⁴⁷
Mar. 1.8	29.034	43.38 ³⁶	23.399	97.44 ⁴³	42.803	46.17 ²⁸
11.8	28.837	43.74 [—]	23.090	97.87 ¹⁰	42.633	46.45 ¹⁰
21.7	28.638	43.74 ³⁶	22.777	97.77 ⁵⁹	42.460	46.55 ⁸
31.7	28.445	43.38 ⁷¹	22.473	97.18 ¹⁰⁸	42.293	46.47 ²⁶
Apr. 10.7	28.270	42.67 ¹⁰³	22.188	96.10 ¹⁵⁴	42.142	46.21 ⁴⁴
20.7	28.119	41.64 ¹³⁴	21.935	94.56 ¹⁹⁴	42.016	45.77 ⁶²
30.6	28.002	40.30 ¹⁶³	21.722	92.62 ²³²	41.923	45.15 ⁷⁹
May 10.6	27.923	38.67 ¹⁸⁸	21.556	90.30 ²⁶³	41.866	44.36 ⁹⁵
20.6	27.885	36.79 ²⁰⁸	21.442	87.67 ²⁸⁹	41.850	43.41 ¹¹¹
30.5	27.892	34.71 ²²⁴	21.384	84.78 ³⁰⁶	41.876	42.30 ¹²⁴
June 9.5	27.943	32.47 ²³⁴	21.384	81.72 ³¹⁸	41.945	41.06 ¹³³
19.5	28.037	30.13 ²³⁹	21.440	78.54 ³²⁰	42.055	39.73 ¹⁴²
29.5	28.172	27.74 ²³⁷	21.553	75.34 ³¹³	42.201	38.31 ¹⁴³
July 9.4	28.345	25.37 ²²⁷	21.719	72.21 ²⁹⁷	42.383	36.88 ¹⁴¹
19.4	28.550	23.10 ²¹¹	21.933	69.24 ²⁷³	42.595	35.47 ¹³⁵
29.4	28.783	20.99 ¹⁸⁸	22.191	66.51 ²⁴⁰	42.832	34.12 ¹²²
Aug. 8.4	29.040	19.11 ¹⁵⁷	22.486	64.11 ¹⁹⁸	43.089	32.90 ¹⁰⁶
18.3	29.315	17.54 ¹²¹	22.811	62.31 ¹⁴⁹	43.361	31.84 ⁸⁶
28.3	29.603	16.33 ⁸⁰	23.160	60.64 ⁹⁴	43.645	30.98 ⁶⁰
Sept. 7.3	29.898	15.53 ³⁴	23.523	59.70 ³⁵	43.935	30.38 ³²
17.2	30.197	15.19 ¹²	23.895	59.35 ²⁷	44.228	30.06 ³
27.2	30.494	15.31 ⁵⁹	24.266	59.62 ⁸⁸	44.519	30.03 ²⁸
Oct. 7.2	30.784	15.90 ¹⁰⁶	24.628	60.50 ¹⁴⁹	44.805	30.31 ⁵⁷
17.2	31.063	16.96 ¹⁴⁸	24.973	61.99 ²⁰⁴	45.082	30.88 ⁸⁴
27.1	31.327	18.44 ¹⁸⁵	25.293	64.03 ²⁵²	45.348	31.72 ¹⁰⁸
Nov. 6.1	31.570	20.29 ²¹⁵	25.580	66.55 ²⁹²	45.596	32.80 ¹²⁶
16.1	31.788	22.44 ²³⁸	25.826	69.47 ³²¹	45.822	34.06 ¹⁴⁰
26.1	31.975	24.82 ²⁵⁰	26.025	72.68 ³³⁹	46.023	35.46 ¹⁴⁶
Dec. 6.0	32.127	27.32 ²⁵⁵	26.170	76.07 ³⁴⁵	46.192	36.92 ¹⁴⁹
15.9	32.239	29.87 ²⁵⁰	26.259	79.52 ³⁴⁰	46.325	38.41 ¹⁴⁶
25.9	32.307	32.37 ²³⁸	26.286	82.92 ³²⁴	46.417	39.87 ¹³⁷
35.9	32.330	34.75	26.252	86.16	46.466	41.24
Mean Place	27.488	35.96	22.130	84.89	41.042	44.59
Sec δ , Tan δ	1.070	—0.380	1.470	—1.077	1.000	—0.006
a, a'	+2.6	+3.0	+1.6	+2.8	+3.1	+2.7
b, b'	0.00	—1.0	—0.01	—1.0	0.00	—1.0
Authority and Catalogue No.	A.N.	333	N.A.	335	B.J.	336

APPARENT PLACES OF STARS, 1935

395

AT UPPER TRANSIT AT GREENWICH

Name	α Leporis		ι Orionis		ε Orionis	
	2.69	Fo	2.89	Oe5	1.75	Bo
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 5 ^m 29	— [°] 17 ['] 51	^h 5 ^m 32	— [°] 5 ['] 56	^h 5 ^m 32	— [°] 1 ['] 14
Jan. 0.9	53.868	60.78 ²¹⁵	17.294	60.46 ¹⁵⁹	57.015	27.35 ¹³⁵
10.9	53.873 ⁵	62.93 ³⁹	17.316 ²²	62.05 ¹⁴³	57.042 ²⁷	28.70 ¹²¹
20.9	53.834 ⁸³	64.86 ¹⁶⁶	17.294 ⁶⁵	63.48 ¹²⁴	57.025 ⁶⁰	29.91 ¹⁰⁴
30.9	53.751 ¹²¹	66.52 ¹³⁷	17.229 ¹⁰³	64.72 ¹⁰²	56.965 ⁹⁸	30.95 ⁸⁶
Feb. 9.8	53.630 ¹⁵³	67.89 ¹⁰⁵	17.126 ¹³⁴	65.74 ⁷⁹	56.867 ¹³¹	31.81 ⁶⁸
19.8	53.477 ¹⁷⁶	68.94 ⁷²	16.992 ¹⁵⁹	66.53 ⁵⁷	56.736 ¹⁵⁵	32.49 ⁴⁸
Mar. 1.8	53.301 ¹⁹⁰	69.66 ³⁸	16.833 ¹⁷³	67.10 ³	56.581 ¹⁶⁹	32.97 ³⁰
11.8	53.111 ¹⁹⁴	70.04 ⁴	16.660 ¹⁷⁸	67.43 ³³	56.412 ¹⁷⁴	33.27 ¹¹
21.7	52.917 ¹⁸⁸	70.08 ²⁹	16.482 ¹⁷¹	67.52 ¹⁴	56.238 ¹⁶⁸	33.38 ⁸
31.7	52.729 ¹⁷¹	69.79 ⁶³	16.311 ¹⁵⁶	67.38 ³⁸	56.070 ¹⁵⁴	33.30 ²⁷
Apr. 10.7	52.558 ¹⁴⁷	69.16 ⁹³	16.155 ¹³²	67.00 ⁶⁰	55.916 ¹²⁹	33.03 ⁴⁶
20.7	52.411 ¹¹⁵	68.23 ¹²³	16.023 ¹⁰¹	66.40 ⁸¹	55.787 ⁹⁷	32.57 ⁶⁴
30.6	52.296 ⁷⁷	67.00 ¹⁵⁰	15.922 ⁶³	65.59 ¹⁰²	55.690 ⁶⁰	31.93 ⁸²
May 10.6	52.219 ³⁶	65.50 ¹⁷³	15.859 ²⁴	64.57 ¹²¹	55.630 ²⁰	31.11 ⁹⁸
20.6	52.183 ⁷	63.77 ¹⁹⁴	15.835 ¹⁸	63.36 ¹³⁸	55.610 ²²	30.13 ¹¹⁴
30.5	52.190 ⁵⁰	61.83 ²¹⁰	15.853 ⁶¹	61.98 ¹⁵²	55.632 ⁶⁴	28.99 ¹²⁷
June 9.5	52.240 ⁹³	59.73 ²²¹	15.914 ¹⁰²	60.46 ¹⁶²	55.696 ¹⁰⁵	27.72 ¹³⁷
19.5	52.333 ¹³²	57.52 ²²⁶	16.016 ¹³⁸	58.84 ¹⁶⁹	55.801 ¹⁴³	26.35 ¹⁴⁴
29.5	52.465 ¹⁶⁹	55.26 ²²⁵	16.154 ¹⁷⁵	57.15 ¹⁷⁰	55.944 ¹⁷⁷	24.91 ¹⁴⁷
July 9.4	52.634 ²⁰³	53.01 ²¹⁶	16.329 ²⁰⁵	55.45 ¹⁶⁶	56.121 ²⁰⁸	23.44 ¹⁴⁴
19.4	52.837 ²²⁹	50.85 ²⁰²	16.534 ²³¹	53.79 ¹⁵⁷	56.329 ²³³	22.00 ¹³⁷
29.4	53.066 ²⁵³	48.83 ¹⁸⁰	16.765 ²⁵²	52.22 ¹⁴²	56.562 ²⁵⁴	20.63 ¹²⁵
Aug. 8.4	53.319 ²⁷⁰	47.03 ¹⁵²	17.017 ²⁶⁸	50.80 ¹²²	56.816 ²⁷⁰	19.38 ¹⁰⁸
18.3	53.589 ²⁸⁴	45.51 ¹¹⁸	17.285 ²⁸¹	49.58 ⁹⁶	57.086 ²⁸²	18.30 ⁸⁷
28.3	53.873 ²⁹²	44.33 ⁸⁰	17.566 ²⁸⁷	48.62 ⁶⁷	57.368 ²⁸⁹	17.43 ⁶⁰
Sept. 7.3	54.165 ²⁹⁶	43.53 ³⁶	17.853 ²⁹¹	47.95 ³³	57.657 ²⁹²	16.83 ³²
17.2	54.461 ²⁹⁴	43.17 ⁹	18.144 ²⁹⁰	47.62 ¹	57.949 ²⁹¹	16.51 ¹
27.2	54.755 ²⁸⁹	43.26 ⁵³	18.434 ²⁸⁶	47.63 ³⁶	58.240 ²⁸⁶	16.50 ²⁹
Oct. 7.2	55.044 ²⁸⁰	43.79 ⁹⁸	18.720 ²⁷⁷	47.99 ⁷¹	58.526 ²⁷⁹	16.79 ⁶⁰
17.2	55.324 ²⁶⁵	44.77 ¹³⁹	18.997 ²⁶⁵	48.70 ¹⁰³	58.805 ²⁶⁷	17.39 ⁸⁸
27.1	55.589 ²⁴⁶	46.16 ¹⁷⁵	19.262 ²⁴⁸	49.73 ¹³¹	59.072 ²⁵⁰	18.27 ¹¹³
Nov. 6.1	55.835 ²²¹	47.91 ²⁰³	19.510 ²²⁶	51.04 ¹⁵³	59.322 ²³⁰	19.40 ¹³¹
16.1	56.056 ¹⁹²	49.94 ²²⁵	19.736 ²⁰⁰	52.57 ¹⁶⁹	59.552 ²⁰³	20.71 ¹⁴⁶
26.1	56.248 ¹⁵⁹	52.19 ²³⁷	19.936 ¹⁶⁸	54.26 ¹⁷⁹	59.755 ¹⁷²	22.17 ¹⁵³
Dec. 6.0	56.407 ¹¹⁹	54.56 ²⁴²	20.104 ¹³¹	56.05 ¹⁸¹	59.927 ¹³⁶	23.70 ¹⁵⁵
15.9	56.526 ⁷⁶	56.98 ²³⁹	20.235 ⁹¹	57.86 ¹⁷⁸	60.063 ⁹⁶	25.25 ¹⁵¹
25.9	56.602 ³²	59.37 ²²⁶	20.326 ⁴⁸	59.64 ¹⁶⁹	60.159 ⁵²	26.76 ¹⁴⁴
35.9	56.634	61.63	20.374	61.33	60.211	28.20
Mean Place	51.705	62.87	15.110	63.63	54.807	30.96
Secδ, Tanδ	1.051	— 0.322	1.005	— 0.104	1.000	— 0.022
a, a'	+2.6	+ 2.6	+2.9	+ 2.4	+3.0	+ 2.4
b, b'	0.00	— 1.0	0.00	— 1.0	0.00	— 1.0
Authority and Catalogue No.	B.J.	338	B.J.	343	B.J.	344

‡ Second transit, Dec. 15

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	β Doradus		ζ Tauri		α Columbae	
	3.81	F5p	3.00	B3p	2.75	B5p
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 5 ^m 33	—62° 31'	^h 5 ^m 33	+21° 06'	^h 5 ^m 37	—34° 06'
Jan. 0.9	06.48	55.89	47.925	22.42	19.827	26.16
10.9	06.31	59.16	47.967	22.34	19.808	28.97
20.9	06.06	62.11	47.960	22.30	19.739	31.50
30.9	05.74	64.64	47.907	22.27	19.623	33.70
Feb. 9.8	05.35	66.71	47.811	22.25	19.463	35.52
19.8	04.91	68.26	47.679	22.21	19.269	36.92
Mar. 1.8	04.43	69.28	47.521	22.14	19.049	37.88
11.8	03.93	69.75	47.346	22.03	18.813	38.39
21.7	03.43	69.67	47.166	21.87	18.572	38.44
31.7	02.94	69.05	46.993	21.68	18.337	38.05
Apr. 10.7	02.48	67.92	46.837	21.47	18.117	37.22
20.7	02.06	66.30	46.707	21.24	17.923	35.99
30.6	01.69	64.24	46.611	21.02	17.763	34.37
May 10.6	01.38	61.80	46.555	20.83	17.643	32.42
20.6	01.14	59.01	46.544	20.69	17.567	30.16
30.5	00.99	55.96	46.579	20.61	17.538	27.65
June 9.5	00.91	52.72	46.658	20.62	17.557	24.97
19.5	00.91	49.37	46.782	20.70	17.625	22.16
29.5	01.00	45.99	46.946	20.87	17.738	19.31
July 9.4	01.17	42.68	47.147	21.12	17.894	16.49
19.4	01.41	39.54	47.379	21.42	18.089	13.78
29.4	01.72	36.67	47.639	21.77	18.319	11.27
Aug. 8.4	02.10	34.14	47.920	22.14	18.578	09.04
18.3	02.52	32.06	48.217	22.50	18.862	07.18
28.3	02.98	30.49	48.526	22.83	19.164	05.73
Sept. 7.3	03.48	29.49	48.842	23.11	19.478	04.78
17.2	03.99	29.13	49.161	23.32	19.800	04.36
27.2	04.50	29.41	49.480	23.45	20.122	04.50
Oct. 7.2	04.99	30.34	49.795	23.49	20.438	05.19
17.2	05.47	31.90	50.102	23.43	20.744	06.44
27.1	05.90	34.05	50.396	23.31	21.033	08.19
Nov. 6.1	06.28	36.71	50.675	23.13	21.298	10.40
16.1	06.60	39.79	50.932	22.91	21.534	12.98
26.1	06.84	43.19	51.162	22.67	21.734	15.84
Dec. 6.0	06.99	46.78	51.359	22.45	21.893	18.87
15.9	07.06†	50.44	51.518†	22.25	22.007†	21.98
25.9	07.04	54.05	51.634	22.09	22.071	25.05
35.9	06.93	57.49	51.703	21.97	22.083	27.99
Mean Place	03.413	55.49	45.477	16.67	17.576	27.15
Secd, Tanδ	2.168	— 1.924	1.072	+ 0.386	1.208	— 0.677
a, a'	+0.5	+ 2.4	+3.6	+ 2.3	+2.2	+ 2.0
b, b'	—0.02	— 1.0	0.00	— 1.0	0.00	— 1.0
Authority and Catalogue No.	B.J.	345	B.J.	346	B.J.	349

† Second transit, Dec. 15

† First transit, Dec. 16

APPARENT PLACES OF STARS, 1935

397

AT UPPER TRANSIT AT GREENWICH

Name	ζ Orionis		130 Tauri		κ Orionis	
	2.05	Bo	5.51	Fo	2.20	Bo
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 5 ^m 37	[°] — 1 ['] 58	^h 5 ^m 43	[°] + 17 ['] 42	^h 5 ^m 44	[°] — 9 ['] 41
Jan. 0.9	30.845	27.93	41.070	27.87	42.541	26.15
10.9	30.876	29.32	41.120	27.57	42.571	27.98
20.9	30.861	30.59	41.122	27.33	42.555	29.64
30.9	30.804	31.67	41.077	27.15	42.495	31.07
Feb. 9.9	30.708	32.58	40.990	27.00	42.395	32.27
19.8	30.579	33.28	40.867	26.87	42.262	33.21
Mar. 1.8	30.425	33.80	40.715	26.76	42.103	33.89
11.8	30.256	34.12	40.545	26.65	41.928	34.29
21.7	30.082	34.23	40.369	26.53	41.746	34.43
31.7	29.912	34.13	40.197	26.41	41.569	34.30
Apr. 10.7	29.757	33.86	40.040	26.29	41.404	33.90
20.7	29.626	33.39	39.907	26.19	41.263	33.26
30.6	29.525	32.74	39.806	26.12	41.151	32.36
May 10.6	29.460	31.91	39.743	26.09	41.074	31.24
20.6	29.438	30.90	39.723	26.12	41.037	29.92
30.6	29.456	29.74	39.747	26.22	41.041	28.40
June 9.5	29.515	28.44	39.815	26.40	41.087	26.74
19.5	29.614	27.05	39.926	26.65	41.174	24.97
29.5	29.752	25.59	40.078	26.98	41.299	23.14
July 9.4	29.925	24.11	40.265	27.37	41.460	21.29
19.4	30.129	22.63	40.484	27.81	41.653	19.48
29.4	30.360	21.25	40.731	28.26	41.873	17.78
Aug. 8.4	30.610	19.99	41.000	28.70	42.116	16.24
18.3	30.877	18.89	41.285	29.12	42.377	14.93
28.3	31.157	18.01	41.584	29.48	42.653	13.89
Sept. 7.3	31.444	17.40	41.891	29.75	42.937	13.17
17.3	31.735	17.09	42.202	29.92	43.227	12.81
27.2	32.026	17.08	42.515	29.97	43.519	12.84
Oct. 7.2	32.314	17.39	42.825	29.89	43.807	13.25
17.2	32.595	18.02	43.128	29.70	44.089	14.05
27.1	32.864	18.93	43.421	29.40	44.361	15.19
Nov. 6.1	33.116	20.09	43.700	29.01	44.616	16.65
16.1	33.349	21.44	43.958	28.56	44.851	18.36
26.1	33.556	22.94	44.191	28.09	45.059	20.25
Dec. 6.0	33.731	24.53	44.393	27.61	45.236	22.26
16.0	33.871†	26.15	44.557	27.16	45.377	24.32
25.9	33.973	27.72	44.680	26.75	45.476	26.34
35.9	34.026	29.21	44.757	26.41	45.532	28.27
Mean Place	28.635	31.36	38.658	22.94	40.353	28.86
Secδ, Tanδ	1.001	— 0.034	1.050	+ 0.319	1.014	— 0.171
a, a'	+3.0	+ 2.0	+3.5	+ 1.4	+2.8	+ 1.3
b, b'	0.00	— 1.0	0.00	— 1.0	0.00	— 1.0
Authority and Catalogue No.	A.E.	350	A.N.	354	B.J.	357

† First transit, Dec. 16

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	β Columbae		α Orionis (<i>Betelgeuse</i>)		β Aurigae	
Mag. Spect.	3.22	Ko	Var.	Ma	2.07	Aop
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 5 ^m 48	-35° 47'	^h 5 ^m 51	+ 7° 23'	^h 5 ^m 54	+44° 56'
Jan. 0.9	42.250	28.98	41.386	51.31	48.735	40.67
10.9	42.241 ⁹	31.89 ²⁹¹	41.438 ⁵²	50.39 ⁹²	48.806 ⁷¹	41.98 ¹³¹
20.9	42.178 ⁶³	34.55 ²⁶⁶	41.443 ⁵	49.58 ⁸¹	48.811 ⁵	43.26 ¹²⁸
30.9	42.066 ¹¹²	36.87 ²³²	41.402 ⁴¹	48.89 ⁶⁹	48.752 ⁵⁹	44.44 ¹¹⁸
Feb. 9.9	41.909 ¹⁵⁷	38.82 ¹⁹⁵	41.320 ⁸²	48.32 ⁵⁷	48.635 ¹¹⁷	45.47 ¹⁰³
19.8	41.715 ¹⁹⁴	40.35 ¹⁵³	41.202 ¹¹⁸	47.87 ⁴⁵	48.468 ¹⁶⁷	46.29 ⁸²
Mar. 1.8	41.493 ²²²	41.43 ¹⁰⁸	41.056 ¹⁴⁶	47.53 ³⁴	48.262 ²⁰⁶	46.87 ⁵⁸
11.8	41.252 ²⁴¹	42.05 ⁶²	40.892 ¹⁶⁴	47.30 ²³	48.029 ²³³	47.18 ³¹
21.7	41.005 ²⁴⁷	42.21 ¹⁶	40.720 ¹⁷²	47.18 ¹²	47.786 ²⁴³	47.20 ²
31.7	40.761 ²⁴⁴	41.92 ²⁹	40.551 ¹⁶⁹	47.16 ²	47.546 ²⁴⁰	46.93 ²⁷
Apr. 10.7	40.531 ²³⁰	41.18 ⁷⁴	40.395 ¹⁵⁶	47.24 ⁸	47.322 ²²⁴	46.39 ⁵⁴
20.7	40.325 ²⁰⁶	40.02 ¹¹⁶	40.261 ¹³⁴	47.43 ¹⁹	47.129 ¹⁹³	45.60 ⁷⁹
30.6	40.151 ¹⁷⁴	38.46 ¹⁵⁶	40.157 ¹⁰⁴	47.73 ³⁰	46.978 ¹⁵¹	44.60 ¹⁰⁰
May 10.6	40.016 ¹³⁵	36.54 ¹⁹²	40.088 ⁶⁹	48.14 ⁴¹	46.874 ¹⁰⁴	43.43 ¹¹⁷
20.6	39.925 ⁹¹	34.31 ²²³	40.059 ²⁹	48.67 ⁵³	46.826 ⁴⁸	42.15 ¹²⁸
30.6	39.881 ⁴⁴	31.82 ²⁴⁹	40.071 ¹²	49.31 ⁶⁴	46.835 ⁹	40.80 ¹³⁵
June 9.5	39.885 ⁴	29.13 ²⁶⁹	40.126 ⁵⁵	50.06 ⁷⁵	46.903 ⁶⁸	39.43 ¹³⁷
19.5	39.937 ⁵²	26.30 ²⁸³	40.221 ⁹⁵	50.89 ⁸³	47.027 ¹²⁴	38.08 ¹³⁵
29.5	40.036 ⁹⁹	23.41 ²⁸⁹	40.355 ¹³⁴	51.81 ⁹⁴	47.205 ¹⁷⁸	36.80 ¹²⁸
July 9.4	40.180 ¹⁴⁴	20.54 ²⁸⁷	40.524 ¹⁶⁹	52.75 ⁹²	47.432 ²²⁷	35.60 ¹²⁰
19.4	40.364 ¹⁸⁴	17.77 ²⁷⁷	40.724 ²⁰⁰	53.70 ⁹⁵	47.704 ²⁷²	34.52 ¹⁰⁸
29.4	40.585 ²²¹	15.19 ²⁵⁸	40.951 ²²⁷	54.62 ⁹²	48.014 ³¹⁰	33.57 ⁹⁵
Aug. 8.4	40.838 ²⁵³	12.88 ²³¹	41.200 ²⁴⁹	55.47 ⁸⁵	48.355 ³⁴¹	32.76 ⁸¹
18.3	41.117 ²⁷⁹	10.92 ¹⁹⁶	41.467 ²⁶⁷	56.21 ⁷⁴	48.723 ³⁶⁸	32.10 ⁶⁶
28.3	41.417 ³⁰⁰	09.38 ¹⁵⁴	41.747 ²⁸⁰	56.81 ⁶⁰	49.110 ³⁸⁷	31.60 ⁵⁰
Sept. 7.3	41.732 ³¹⁵	08.33 ¹⁰⁵	42.037 ²⁹⁰	57.23 ⁴²	49.512 ⁴⁰²	31.25 ³⁵
17.3	42.056 ³²⁴	07.82 ⁵¹	42.333 ²⁹⁶	57.45 ²²	49.923 ⁴¹¹	31.06 ¹⁹
27.2	42.384 ³²⁸	07.87 ⁵	42.632 ²⁹⁹	57.44 ¹	50.338 ⁴¹⁵	31.02 ⁴
Oct. 7.2	42.709 ³²⁵	08.49 ⁶²	42.928 ²⁹⁶	57.20 ²⁴	50.750 ⁴¹²	31.14 ¹²
17.2	43.024 ³¹⁵	09.67 ¹¹⁸	43.220 ²⁹²	56.74 ⁴⁶	51.158 ⁴⁰⁸	31.41 ²⁷
27.1	43.323 ²⁹⁹	11.39 ¹⁷²	43.503 ²⁸³	56.08 ⁶⁶	51.553 ³⁹⁵	31.84 ⁴³
Nov. 6.1	43.601 ²⁷⁸	13.57 ²¹⁸	43.773 ²⁷⁰	55.24 ⁸⁴	51.930 ³⁷⁷	32.43 ⁵⁹
16.1	43.850 ²⁴⁹	16.15 ²⁵⁸	44.024 ²⁵¹	54.27 ⁹⁷	52.281 ³⁵¹	33.17 ⁷⁴
26.1	44.063 ²¹³	19.03 ²⁸⁸	44.251 ²²⁷	53.20 ¹⁰⁷	52.598 ³¹⁷	34.08 ⁹¹
Dec. 6.0	44.235 ¹⁷²	22.11 ³⁰⁸	44.448 ¹⁹⁷	52.09 ¹¹¹	52.873 ²⁷⁵	35.12 ¹⁰⁴
16.0	44.360 ¹²⁵	25.29 ³¹⁸	44.610 ¹⁶²	50.98 ¹¹¹	53.099 ²²⁶	36.29 ¹¹⁷
25.9	44.435 ¹⁹	28.44 ⁷⁵	44.732 ¹²²	49.91 ¹⁰⁷	53.268 ¹⁶⁹	37.54 ¹²⁵
35.9	44.457 ²²	31.49 ³⁰⁵	44.809 ⁷⁷	48.92 ⁹⁹	53.375 ¹⁰⁷	38.84 ¹³⁰
Mean Place	39.977	30.17	39.086	47.53	45.554	34.54
Secd, Tanδ	1.233	- 0.721	1.008	+ 0.130	1.413	+ 0.998
α, α'	+2.1	+ 1.0	+3.2	+ 0.7	+4.4	+ 0.5
b, b'	0.00	- 1.0	0.00	- 1.0	0.00	- 1.0
Authority and Catalogue No.	A.N.	362	B.J.	365	B.J.	368

APPARENT PLACES OF STARS, 1935

399

AT UPPER TRANSIT AT GREENWICH

Name	θ Aurigæ		ι Geminorum		ν Orionis	
	2.72	Aop	4.30	G5	4.40	Ba
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 5 ^m 55	+37° 12'	^h 6 ^m 00	+23° 16'	^h 6 ^m 03	+14° 46'
Jan. 0.9	20.125 ⁷¹	41.64 ⁸⁶	12.578 ⁷⁰	11.31 ¹	53.949 ⁶⁸	44.07 ⁵¹
10.9	20.196	42.50 ⁸⁶	12.648 ¹⁸	11.32 ⁷	54.017	43.56 ⁴³
20.9	20.207 ⁴⁶	43.36 ⁸⁰	12.666 ³¹	11.39 ⁹	54.036 ²⁹	43.13 ³³
30.9	20.161 ⁹⁸	44.16 ⁷¹	12.635 ⁷⁸	11.48 ¹²	54.007 ⁷³	42.80 ²⁶
Feb. 9.9	20.063 ¹⁴³	44.87 ⁵⁸	12.557 ¹¹⁹	11.60 ¹⁰	53.934 ¹¹²	42.54 ²⁰
19.8	19.920 ¹⁷⁹	45.45 ³⁹	12.438 ¹⁵¹	11.70 ⁶	53.822 ¹⁴²	42.34 ¹⁴
Mar. 1.8	19.741 ²⁰²	45.84 ²⁰	12.287 ¹⁷³	11.76 ²	53.680 ¹⁶⁴	42.20 ¹¹
11.8	19.539 ²¹³	46.04 ¹	12.114 ¹⁸²	11.78 ⁴	53.516 ¹⁷⁴	42.09 ⁸
21.8	19.326 ²¹⁰	46.03 ²²	11.932 ¹⁸¹	11.74 ¹²	53.342 ¹⁷²	42.01 ⁵
31.7	19.116 ¹⁹⁴	45.81 ⁴²	11.751 ¹⁶⁷	11.62 ¹⁷	53.170 ¹⁶²	41.96 ³
Apr. 10.7	18.922 ¹⁶⁷	45.39 ⁶⁰	11.584 ¹⁴⁶	11.45 ²¹	53.008 ¹⁴⁰	41.93 ¹
20.7	18.755 ¹³¹	44.79 ⁷⁴	11.438 ¹¹⁵	11.24 ²⁴	52.868 ¹¹¹	41.94 ⁵
30.6	18.624 ⁸⁸	44.05 ⁸⁵	11.323 ⁷⁴	11.00 ²⁵	52.757 ⁷⁶	41.99 ¹¹
May 10.6	18.536 ³⁸	43.20 ⁹²	11.249 ³⁶	10.75 ²⁴	52.681 ³⁷	42.10 ¹⁶
20.6	18.498 ¹⁴	42.28 ⁹⁶	11.213 ¹¹	10.51 ²²	52.644 ⁵	42.26 ²⁴
30.6	18.512 ⁶⁵	41.32 ⁹⁵	11.224 ⁵⁶	10.29 ¹⁸	52.649 ⁴⁸	42.50 ³⁰
June 9.5	18.577 ¹¹⁶	40.37 ⁹²	11.280 ⁹⁹	10.11 ¹¹	52.697 ⁹⁰	42.80 ³⁸
19.5	18.693 ¹⁶⁴	39.45 ⁸⁴	11.379 ¹⁴⁰	10.00 ⁵	52.787 ¹²⁸	43.18 ⁴⁴
29.5	18.857 ²⁰⁷	38.61 ⁷⁸	11.519 ¹⁷⁹	09.95 [—]	52.915 ¹⁶⁶	43.62 ⁴⁸
July 9.5	19.064 ²⁴⁷	37.83 ⁶⁸	11.698 ²¹⁴	09.95 ⁵	53.081 ¹⁹⁸	44.10 ⁵⁰
19.4	19.311 ²⁸¹	37.15 ⁵⁹	11.912 ²⁴³	10.00 ⁹	53.279 ²²⁶	44.60 ⁵⁰
29.4	19.592 ³⁰⁸	36.56 ⁴⁸	12.155 ²⁶⁶	10.09 ¹⁰	53.505 ²⁵⁰	45.10 ⁴⁷
Aug. 8.4	19.900 ³³²	36.08 ³⁹	12.421 ²⁸⁸	10.19 ¹²	53.755 ²⁶⁹	45.57 ⁴²
18.3	20.232 ³⁴⁸	35.69 ²⁹	12.709 ³⁰²	10.31 ⁷	54.024 ²⁸⁴	45.99 ³²
28.3	20.580 ³⁶¹	35.40 ²⁰	13.011 ³¹³	10.38 ⁴	54.308 ²⁹⁶	46.31 ²¹
Sept. 7.3	20.941 ³⁶⁹	35.20 ¹²	13.324 ³²¹	10.42 [—]	54.604 ³⁰³	46.52 ⁸
17.3	21.310 ³⁷²	35.08 ⁵	13.645 ³²⁵	10.42 ⁷	54.907 ³⁰⁷	46.60 ⁸
27.2	21.682 ³⁷¹	35.03 ⁴	13.970 ³²⁴	10.35 ¹⁶	55.214 ³⁰⁸	46.52 ²³
Oct. 7.2	22.053 ³⁶⁶	35.07 ¹¹	14.294 ³²¹	10.19 ¹⁹	55.522 ³⁰⁶	46.29 ³⁸
17.2	22.419 ³⁵⁶	35.18 ²⁰	14.615 ³¹³	10.00 ²⁴	55.828 ²⁹⁸	45.91 ⁵¹
27.2	22.775 ³⁴⁰	35.38 ³⁰	14.928 ³⁰⁰	09.76 ²⁹	56.126 ²⁸⁵	45.40 ⁶²
Nov. 6.1	23.115 ³¹⁸	35.68 ³⁹	15.228 ²⁸¹	09.47 ²⁷	56.411 ²⁶⁹	44.78 ⁶⁹
16.1	23.433 ²⁸⁸	36.07 ⁵⁰	15.509 ²⁵⁸	09.20 ²⁹	56.680 ²⁴⁶	44.09 ⁷⁴
26.1	23.721 ²⁵²	36.57 ⁶¹	15.767 ²²⁶	08.91 ²²	56.926 ²¹⁷	43.35 ⁷⁴
Dec. 6.0	23.973 ²⁰⁷	37.18 ⁷⁰	15.993 ¹⁸⁸	08.69 ¹⁸	57.143 ¹⁸¹	42.61 ⁷¹
16.0	24.180 ¹⁵⁸	37.88 ⁷⁸	16.181 ¹⁴⁵	08.51 ¹¹	57.324 ¹⁴¹	41.90 ⁶⁵
25.9	24.338 ¹⁰²	38.66 ⁸⁴	16.326 ⁹⁸	08.40 ⁴	57.465 ⁹⁴	41.25 ⁵⁸
35.9	24.440	39.50	16.424	08.36	57.559	40.67
Mean Place	17.246	36.04	10.041	06.90	51.545	40.35
Secδ, Tanδ	1.256	+ 0.759	1.089	+ 0.430	1.034	+ 0.264
a, a'	+4.1	+ 0.4	+3.6	0.0	+3.4	- 0.3
b, b'	0.00	- 1.0	0.00	- 1.0	0.00	- 1.0
Authority and Catalogue No.	B.J.	369	A.E.	373	B.J.	377

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	η Geminorum		ζ Canis Majoris		μ Geminorum	
	Var.	Ma	3.10	B ₃	3.19	Ma
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₆ ^m ₁₀	^s ₊₂₂ ['] ₃₁	^h ₆ ^m ₁₇	^s ₋₃₀ ['] ₀₁	^h ₆ ^m ₁₉	^s ₊₂₂ ['] ₃₂
Jan. 0.9	59.690 ⁸⁰	42.23 ⁵	51.174 ³⁴	57.95 ²⁸⁸	04.177 ⁸⁸	58.44 ⁷
10.9	59.770 ²⁸	42.18 ²	51.208 ¹⁸	60.83 ²⁶⁷	04.265 ³⁷	58.37 ¹
20.9	59.798 ²²	42.20 ⁷	51.190 ⁶⁹	63.50 ²⁴⁰	04.302 ¹⁵	58.38 ⁷
30.9	59.776 ⁷¹	42.27 ¹⁰	51.121 ¹¹⁵	65.90 ²⁰⁶	04.287 ⁶⁴	58.45 ¹¹
Feb. 9.9	59.705 ¹¹¹	42.37 ¹¹	51.006 ¹⁵⁶	67.96 ¹⁶⁸	04.223 ¹⁰⁶	58.56 ¹³
19.8	59.594 ¹⁴⁵	42.48 ⁹	50.850 ¹⁸⁸	69.64 ¹²⁰	04.117 ¹⁴⁰	58.69 ¹¹
Mar. 1.8	59.449 ¹⁶⁸	42.57 ⁴	50.662 ²¹⁰	70.93 ⁸⁷	03.977 ¹⁶⁷	58.80 ⁷
11.8	59.281 ¹⁸⁰	42.61 ⁵	50.452 ²²²	71.80 ⁴⁵	03.810 ¹⁷⁸	58.87 ³
21.8	59.101 ¹⁸¹	42.61 ⁵	50.230 ²²⁴	72.25 ²	03.632 ¹⁸¹	58.90 ²
31.7	58.920 ¹⁷¹	42.56 ¹¹	50.006 ²¹⁷	72.27 ³⁹	03.451 ¹⁷¹	58.88 ⁹
Apr. 10.7	58.749 ¹⁴⁹	42.45 ¹⁶	49.789 ¹⁹⁶	71.88 ⁸⁰	03.280 ¹⁵²	58.79 ¹³
20.7	58.600 ¹¹⁹	42.29 ¹⁹	49.593 ¹⁷¹	71.08 ¹¹⁸	03.128 ¹²⁴	58.66 ¹⁷
30.7	58.481 ⁸⁴	42.10 ²⁰	49.422 ¹³⁷	69.90 ¹⁵³	03.004 ⁸⁹	58.49 ¹⁹
May 10.6	58.397 ⁴³	41.90 ²⁰	49.285 ⁹⁸	68.37 ¹⁸⁵	02.915 ⁴⁹	58.30 ¹⁹
20.6	58.354 ¹	41.70 ¹⁷	49.187 ⁵⁷	66.52 ²¹²	02.866 ⁶	58.11 ¹⁸
30.6	58.355 ⁴⁵	41.53 ¹⁴	49.130 ¹³	64.40 ²³⁴	02.860 ³⁷	57.93 ¹⁴
June 9.5	58.400 ⁸⁸	41.39 ⁹	49.117 ³¹	62.06 ²⁵¹	02.897 ⁸¹	57.79 ¹²
19.5	58.488 ¹²⁹	41.30 ⁵	49.148 ⁷⁵	59.55 ²⁶¹	02.978 ¹²¹	57.67 ⁶
29.5	58.617 ¹⁶⁸	41.25 ⁴	49.223 ¹¹⁶	56.94 ²⁶³	03.099 ¹⁶⁰	57.61 ⁴
July 9.5	58.785 ²⁰²	41.25 ⁴	49.339 ¹⁵⁵	54.31 ²⁵⁷	03.259 ¹⁹⁵	57.57 [—]
19.4	58.987 ²³²	41.29 ⁶	49.494 ¹⁹⁰	51.74 ²⁴⁵	03.454 ²²⁵	57.57 ²
29.4	59.219 ²⁵⁷	41.35 ⁸	49.684 ²²²	49.29 ²²³	03.679 ²⁵¹	57.59 ²
Aug. 8.4	59.476 ²⁷⁸	41.43 ⁶	49.906 ²⁵⁰	47.06 ¹⁹³	03.930 ²⁷²	57.61 [—]
18.4	59.754 ²⁹⁵	41.49 ³	50.156 ²⁷²	45.13 ¹⁵⁶	04.202 ²⁹¹	57.61 ²
28.3	60.049 ³⁰⁷	41.52 ¹	50.428 ²⁹⁰	43.57 ¹¹³	04.493 ³⁰⁴	57.59 ⁸
Sept. 7.3	60.356 ³¹⁷	41.51 ⁸	50.718 ³⁰⁴	42.44 ⁶⁴	04.797 ³¹⁵	57.51 ¹⁴
17.3	60.673 ³²²	41.43 ¹⁵	51.022 ³¹²	41.80 ¹²	05.112 ³²¹	57.37 ²¹
27.2	60.995 ³²²	41.28 ²²	51.334 ³¹⁵	41.68 ⁴²	05.433 ³²⁵	57.16 ²⁹
Oct. 7.2	61.317 ³²²	41.06 ²⁹	51.649 ³¹³	42.10 ⁹⁷	05.758 ³²⁴	56.87 ³⁵
17.2	61.639 ³¹⁶	40.77 ³⁵	51.962 ³⁰⁴	43.07 ¹⁴⁸	06.082 ³¹⁹	56.52 ⁴¹
27.2	61.955 ³⁰⁴	40.42 ³⁸	52.266 ²⁸⁹	44.55 ¹⁹⁴	06.401 ³⁰⁸	56.11 ⁴⁴
Nov. 6.1	62.259 ²⁸⁸	40.04 ³⁹	52.555 ²⁶⁸	46.49 ²³⁶	06.709 ²⁹³	55.67 ⁴⁵
16.1	62.547 ²⁶⁵	39.65 ³⁷	52.823 ²³⁹	48.85 ²⁶⁷	07.002 ²⁷²	55.22 ⁴²
26.1	62.812 ²³⁴	39.28 ³³	53.062 ²⁰³	51.52 ²⁹⁰	07.274 ²⁴²	54.80 ³⁸
Dec. 6.1	63.046 ¹⁹⁹	38.95 ²⁷	53.265 ¹⁶²	54.42 ³⁰³	07.516 ²⁰⁷	54.42 ³¹
16.0	63.245 ¹⁵⁵	38.68 ¹⁹	53.427 ¹¹⁵	57.45 ³⁰⁵	07.723 ¹⁶⁴	54.11 ²²
26.0	63.400 ¹⁰⁸	38.49 ¹¹	53.542 ⁶⁶	60.50 ²⁹⁸	07.887 ¹¹⁶	53.89 ¹³
35.9	63.508	38.38	53.608	63.48	08.003	53.76
Mean Place	57.152	38.53	48.941	59.93	01.630	55.22
Secd, Tanδ	1.083	+ 0.415	1.155	- 0.578	1.083	+ 0.415
a, a'	+3.6	- 1.0	+2.3	- 1.6	+3.6	- 1.7
b, b'	0.00	- 1.0	0.00	- 1.0	0.00	- 1.0
Authority and Catalogue No.	B.J.	381	B.J.	389	B.J.	390

‡ Second transit, Dec. 25

† First transit, Dec. 26

APPARENT PLACES OF STARS, 1935

401

AT UPPER TRANSIT AT GREENWICH

Name	β Canis Majoris		α Argus (<i>Canopus</i>)		ν Geminorum	
Mag. Spect.	1.99	Br	-0.86	Fo	4.06	B ₅
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 6 ^m 19	-17° 55'	^h 6 ^m 22	-52° 39'	^h 6 ^m 25	+20° 15'
Jan. 0.9	52.344	18.39	33.053	31.56	08.676	20.74
10.9	52.398 54	20.76 237	33.037 16	35.07 351	08.768 92	20.52 22
20.9	52.403 5	22.06 220	32.949 88	38.36 329	08.807 39	20.39 13
30.9	52.360 43	24.01 195	32.793 156	41.34 298	08.798 9	20.35 4
Feb. 9.9	52.273 87	26.58 167	32.576 217	43.93 259	08.740 58	20.36 1
	126	137	269	215	100	4
19.9	52.147	27.95	32.307	46.08	08.640	20.40
Mar. 1.8	51.989 158	28.99 104	31.997 310	47.75 167	08.504 136	20.45 5
11.8	51.810 179	29.69 70	31.657 340	48.91 116	08.344 160	20.51 6
21.8	51.620 190	30.05 36	31.302 355	49.55 64	08.168 176	20.54 3
31.7	51.427 193	30.08 3	30.943 359	49.66 11	07.992 176	20.54
	186	29	350	40	169	5
Apr. 10.7	51.241	29.79	30.593	49.26	07.823	20.49
20.7	51.074 167	29.16 63	30.266 327	48.35 91	07.671 152	20.43 6
30.7	50.932 142	28.23 93	29.971 295	46.97 138	07.547 124	20.35 8
May 10.6	50.821 111	27.02 121	29.717 254	45.16 181	07.453 94	20.27 8
20.6	50.747 74	25.55 147	29.511 206	42.94 222	07.401 52	20.19 8
	35	170	151	255	12	4
30.6	50.712	23.85	29.360	40.39	07.389	20.15
June 9.6	50.717 5	21.96 189	29.267 93	37.56 283	07.418 29	20.14 1
19.5	50.763 46	19.94 202	29.235 32	34.52 304	07.491 73	20.11 3
29.5	50.849 86	17.82 212	29.263 28	31.36 316	07.605 114	20.15 4
July 9.5	50.972 123	15.68 214	29.352 89	28.17 319	07.756 151	20.24 9
	158	211	148	313	186	11
19.4	51.130 189	13.57 200	29.500 202	25.04 299	07.942 215	20.35 11
29.4	51.319 217	11.57 181	29.702 253	22.05 273	08.157 244	20.46 10
Aug. 8.4	51.536 240	09.76 159	29.955 298	19.32 239	08.401 261	20.56 4
18.4	51.776 260	08.17 128	30.253 337	16.93 196	08.662 284	20.60 3
28.3	52.036 275	06.89 91	30.590 368	14.97 145	08.946 296	20.63 5
Sept. 7.3	52.311 287	05.98 50	30.958 392	13.52 88	09.242 308	20.58 13
17.3	52.598 295	05.48 6	31.350 406	12.64 26	09.550 315	20.45 24
27.3	52.893 297	05.42 41	31.756 412	12.38 38	09.865 321	20.21 35
Oct. 7.2	53.190 297	05.83 86	32.168 407	12.76 102	10.186 321	19.86 43
17.2	53.487 290	06.69 129	32.575 393	13.78 164	10.507 319	19.43 52
27.2	53.777 278	07.98 167	32.968 366	15.42 220	10.826 306	18.91 55
Nov. 6.1	54.055 261	09.65 201	33.334 331	17.62 271	11.132 294	18.36 57
16.1	54.316 236	11.66 227	33.665 284	20.33 311	11.426 271	17.79 58
26.1	54.552 206	13.93 245	33.949 230	23.44 341	11.697 244	17.21 52
Dec. 6.1	54.758 170	16.38 254	34.179 167	26.85 360	11.941 206	16.69 46
16.0	54.928 127	18.92 255	34.346 99	30.45 366	12.147 168	16.23 39
26.0	55.055 81	21.47 247	34.445 28	34.11 361	12.315 120	15.84 32
35.9	55.136 27	23.94 247	34.472 27	37.72 28	12.435 28	15.52 32
Mean Place	50.147	20.56	30.458	33.64	06.167	17.94
Sec δ , Tan δ	1.051	-0.323	1.649	-1.311	1.066	+0.369
a, a'	+2.6	-1.7	+1.3	-2.0	+3.6	-2.2
b, b'	0.00	-1.0	+0.01	-1.0	0.00	-1.0
Authority and Catalogue No.	B.J.	394	B.J.	396	A.E.	399

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	γ Geminorum		ν Argus		ϵ Geminorum	
Mag. Spect.	1.93	Ao	3.18	B8	3.18	G5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 6 ^m 33	+16° 27'	^h 6 ^m 35	-43° 07'	^h 6 ^m 39	+25° 11'
Jan. 0.9	59.827	25.20	48.617	74.21	58.576†	51.82
10.9	59.926 ⁹⁹	24.71 ⁴⁹	48.648 ³¹	77.60 ³³⁹	58.688 ¹¹²	51.87 ⁵
20.9	59.974 ⁴⁸	24.34 ³⁷	48.617 ³¹	80.78 ³¹⁸	58.747 ⁵⁹	52.02 ¹⁵
30.9	59.972 ²	24.07 ²⁷	48.527 ⁹⁰	83.68 ²⁹⁰	58.751 ⁴	52.24 ²²
Feb. 9.9	59.922 ⁵⁰	23.90 ¹⁷	48.382 ¹⁴⁵	86.24 ²⁵⁶	58.704 ⁴⁷	52.52 ²⁸
	93	10	193	215	93	28
19.9	59.829 ¹²⁸	23.80 ⁵	48.189 ²³²	88.39 ¹⁷¹	58.611 ¹³²	52.80 ²⁷
Mar. 1.8	59.701 ¹⁵⁴	23.75 ¹	47.957 ²⁶⁰	90.10 ¹²³	58.479 ¹⁶¹	53.07 ²²
11.8	59.547 ¹⁷⁰	23.74 ¹	47.697 ²⁷⁸	91.33 ⁷⁵	58.318 ¹⁷⁸	53.29 ¹⁶
21.8	59.377 ¹⁷⁴	23.75 ²	47.419 ²⁸²	92.08 ²⁵	58.140 ¹⁸⁴	53.45 ⁷
31.8	59.203 ¹⁶⁷	23.77 ²	47.137 ²⁷⁷	92.33 ²³	57.956 ¹⁷⁸	53.52 ¹
Apr. 10.7	59.036 ¹⁵²	23.79 ³	46.860 ²⁶⁰	92.10 ⁷¹	57.778 ¹⁶²	53.51 ⁹
20.7	58.884 ¹²⁷	23.82 ⁴	46.600 ²³⁴	91.39 ¹¹⁶	57.616 ¹³⁷	53.42 ¹⁸
30.7	58.757 ⁹⁵	23.86 ⁶	46.366 ¹⁹⁹	90.23 ¹⁵⁸	57.479 ¹⁰⁵	53.24 ²³
May 10.6	58.662 ⁵⁸	23.92 ⁹	46.167 ¹⁶⁰	88.65 ¹⁹⁶	57.374 ⁶⁶	53.01 ²⁷
20.6	58.604 ¹⁹	24.01 ¹³	46.007 ¹¹⁵	86.69 ²³⁰	57.308 ²⁵	52.74 ²⁹
30.6	58.585 ²²	24.14 ¹⁷	45.892 ⁶⁶	84.39 ²⁵⁷	57.283 ¹⁹	52.45 ³¹
June 9.6	58.607 ⁶³	24.31 ²¹	45.826 ¹⁶	81.82 ²⁷⁹	57.302 ⁶¹	52.14 ²⁹
19.5	58.670 ¹⁰¹	24.52 ²⁴	45.810 ³⁴	79.03 ²⁹³	57.363 ¹⁰²	51.85 ²⁷
29.5	58.771 ¹³⁹	24.76 ²⁸	45.844 ⁸⁴	76.10 ²⁹⁸	57.465 ¹⁴²	51.57 ²⁸
July 9.5	58.910 ¹⁷³	25.04 ²⁸	45.928 ¹³¹	73.12 ²⁹⁴	57.607 ¹⁷⁸	51.30 ²⁴
19.5	59.083 ²⁰³	25.32 ²⁷	46.059 ¹⁷⁶	70.18 ²⁸³	57.785 ²¹⁰	51.06 ²⁴
29.4	59.286 ²²⁹	25.59 ²⁴	46.235 ²¹⁸	67.35 ²⁶¹	57.995 ²³⁸	50.82 ²³
Aug. 8.4	59.515 ²⁵¹	25.83 ¹⁹	46.453 ²⁵⁴	64.74 ²³⁰	58.233 ²⁶³	50.59 ²⁴
18.4	59.766 ²⁷¹	26.02 ¹⁰	46.707 ²⁸⁷	62.44 ¹⁹²	58.496 ²⁸³	50.35 ²⁷
28.3	60.037 ²⁸⁵	26.12 [—]	46.994 ³¹⁴	60.52 ¹⁴⁴	58.779 ³⁰⁰	50.08 ³⁰
Sept. 7.3	60.322 ²⁹⁸	26.12 ¹³	47.308 ³³⁵	59.08 ⁹¹	59.079 ³¹⁴	49.78 ³⁴
17.3	60.620 ³⁰⁶	25.99 ²⁶	47.643 ³⁵⁰	58.17 ³³	59.393 ³²⁴	49.44 ⁴⁰
27.3	60.926 ³¹²	25.73 ⁴⁰	47.993 ³⁵⁶	57.84 ²⁷	59.717 ³³⁰	49.04 ⁴⁵
Oct. 7.2	61.238 ³¹⁴	25.33 ⁵³	48.349 ³⁵⁸	58.11 ⁸⁹	60.047 ³³⁴	48.59 ⁴⁸
17.2	61.552 ³¹²	24.80 ⁶⁴	48.707 ³⁴⁹	59.00 ¹⁴⁸	60.381 ³³²	48.11 ⁵¹
27.2	61.864 ³⁰⁴	24.16 ⁷³	49.056 ³³⁴	60.48 ²⁰⁴	60.713 ³²⁴	47.60 ⁵¹
Nov. 6.2	62.168 ²⁹²	23.43 ⁷⁹	49.390 ³⁰⁸	62.52 ²⁵²	61.037 ³¹²	47.09 ⁴⁸
16.1	62.460 ²⁷¹	22.64 ⁸¹	49.698 ²⁷⁴	65.04 ²⁹²	61.349 ²⁹³	46.61 ⁴³
26.1	62.731 ²⁴⁶	21.83 ⁷⁹	49.972 ²³²	67.96 ³²²	61.642 ²⁶⁶	46.18 ³⁶
Dec. 6.1	62.977 ²¹¹	21.04 ⁷⁵	50.204 ¹⁸³	71.18 ³⁴²	61.908 ²³⁰	45.82 ²⁵
16.0	63.188 ¹⁷²	20.29 ⁶⁶	50.387 ¹²⁷	74.60 ³⁴⁹	62.138 ¹⁸⁹	45.57 ¹⁴
26.0	63.360 ¹²⁶	19.63 ⁵⁵	50.514 ⁶⁷	78.09 ³⁴⁶	62.327 ¹⁴¹	45.43 ³
35.9	63.486 ³¹	19.08 ⁵⁵	50.581 ³¹	81.55 ³⁴⁶	62.468 ³²	45.40 ³
Mean Place	57.376	22.96	46.253	76.69	55.962	49.89
Secd, Tanδ	1.043	+ 0.295	1.370	- 0.937	1.105	+ 0.471
a, a'	+3.5	- 3.0	+1.8	- 3.1	+3.7	- 3.5
b, b'	0.00	- 1.0	+0.01	- 1.0	-0.01	- 1.0
Authority and Catalogue No.	B.J.	403	B.J.	406	B.J.	408

† First transit, Jan. 1

APPARENT PLACES OF STARS, 1935

403

AT UPPER TRANSIT AT GREENWICH

Name	ξ Geminorum		α Canis Majoris (Sirius)		α Pictoris	
Mag. Spect.	3.40	F5	-1.58	A0	3.30	A5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 6 ^m 41	+12° 57'	^h 6 ^m 42	-16° 37'	^h 6 ^m 47	-61° 51'
Jan. 1-0	^s 40.831†	64.08 73	^s 19.200†	32.51 242	^s 34.41	72.81 372
10-9	40.935 53	63.35 60	19.273 73	34.93 225	34.40 10	76.53 356
20-9	40.988 4	62.75 47	19.296 23	37.18 202	34.30 20	80.09 329
30-9	40.992 45	62.28 36	19.271 72	39.20 175	34.10 27	83.38 295
Feb. 9-9	40.947 87	61.92 25	19.199 112	40.95 145	33.83 34	86.33 253
19-9	40.860 123	61.67 16	19.087 146	42.40 113	33.49 39	88.86 207
Mar. 1-8	40.737 149	61.51 9	18.941 170	43.53 82	33.10 44	90.93 157
11-8	40.588 166	61.42 3	18.771 185	44.35 48	32.66 47	92.50 105
21-8	40.422 172	61.39 1	18.586 190	44.83 15	32.19 48	93.55 50
31-8	40.250 167	61.40 6	18.396 184	44.98 17	31.71 48	94.05 2
Apr. 10-7	40.083 151	61.46 10	18.212 170	44.81 48	31.23 45	94.03 56
20-7	39.932 129	61.56 14	18.042 148	44.33 77	30.78 43	93.47 107
30-7	39.803 99	61.70 18	17.894 118	43.56 105	30.35 38	92.40 154
May 10-6	39.704 64	61.88 23	17.776 84	42.51 130	29.97 33	90.86 198
20-6	39.640 26	62.11 29	17.692 48	41.21 152	29.64 26	88.88 237
30-6	39.614 14	62.40 33	17.644 8	39.69 171	29.38 20	86.51 270
June 9-6	39.628 54	62.73 39	17.636 31	37.98 186	29.18 13	83.81 296
19-5	39.682 91	63.12 44	17.667 70	36.12 195	29.05 6	80.85 314
29-5	39.773 128	63.56 44	17.737 107	34.17 199	28.99 3	77.71 323
July 9-5	39.901 162	64.00 45	17.844 141	32.18 196	29.02 10	74.48 323
19-5	40.063 191	64.45 43	17.985 174	30.22 187	29.12 18	71.25 313
29-4	40.254 218	64.88 38	18.159 201	28.35 172	29.30 25	68.12 293
Aug. 8-4	40.472 241	65.26 30	18.360 227	26.63 149	29.55 32	65.19 263
18-4	40.713 260	65.56 19	18.587 248	25.14 120	29.87 37	62.56 224
28-3	40.973 276	65.75 6	18.835 266	23.94 86	30.24 43	60.32 176
Sept. 7-3	41.249 290	65.81 10	19.101 280	23.08 47	30.67 46	58.56 120
17-3	41.539 299	65.71 27	19.381 290	22.61 3	31.13 50	57.36 59
27-3	41.838 306	65.44 44	19.671 297	22.58 41	31.63 50	56.77 6
Oct. 7-2	42.144 309	65.00 61	19.968 298	22.99 85	32.13 51	56.83 73
17-2	42.453 308	64.39 76	20.266 295	23.84 129	32.64 50	57.56 137
27-2	42.761 302	63.63 88	20.561 286	25.13 167	33.14 47	58.93 199
Nov. 6-2	43.063 290	62.75 97	20.847 272	26.80 201	33.61 43	60.92 255
16-1	43.353 271	61.78 102	21.119 250	28.81 227	34.04 37	63.47 301
26-1	43.624 247	60.76 102	21.369 222	31.08 246	34.41 31	66.48 338
Dec. 6-1	43.871 213	59.74 98	21.591 187	33.54 256	34.72 22	69.86 363
16-0	44.084 175	58.76 91	21.778 146	36.10 257	34.94 14	73.49 377
26-0	44.259 131	57.85 80	21.924 101	38.67 251	35.08 5	77.26 378
35-9	44.390	57.05	22.025	41.18	35.13	81.04
Mean Place	38.429	62.25	17.098	32.48	31.447	76.23
Secδ, Tanδ	1.026	+ 0.230	1.044	- 0.299	2.121	- 1.871
a, a'	+3.4	- 3.6	+2.7	- 3.7	+0.6	- 4.1
b, b'	0.00	- 1.0	0.00	- 1.0	+0.03	- 1.0
Authority and Catalogue No.	B.J.	409	A.E.	411	B.J.	417

No. 411. Corrected for a parallax of 0".37. The reductions from *c.g.* to brighter star vary during the year from -0".091, -1".92 to -0".076, -1".86. The mean place is that of *c.g.*

† First transit, Jan. 1

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	τ Argus		θ Canis Majoris		ϵ Canis Majoris	
	2.83	Ko	4.25	K2	1.63	Br
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	$6^{\text{h}} 48^{\text{m}}$	$-50^{\circ} 31'$	$6^{\text{h}} 51^{\text{m}}$	$-11^{\circ} 57'$	$6^{\text{h}} 56^{\text{m}}$	$-28^{\circ} 52'$
Jan. 1.0	21.779	67.40	12.330	19.23	06.390	54.42
10.9	21.810	71.00	12.421	21.42	06.469	57.41
20.9	21.771	74.42	12.463	23.46	06.495	60.25
30.9	21.664	77.58	12.456	25.29	06.467	62.84
Feb. 9.9	21.495	80.41	12.403	26.88	06.389	65.14
19.9	21.270	82.83	12.307	28.20	06.266	67.10
Mar. 1.8	21.001	84.79	12.177	29.24	06.105	68.68
11.8	20.697	86.27	12.020	29.99	05.916	69.87
21.8	20.372	87.24	11.846	30.45	05.709	70.65
31.8	20.038	87.70	11.666	30.62	05.493	71.02
Apr. 10.7	19.708	87.64	11.488	30.52	05.279	70.97
20.7	19.392	87.08	11.323	30.14	05.077	70.53
30.7	19.102	86.04	11.179	29.50	04.895	69.70
May 10.7	18.847	84.54	11.061	28.61	04.741	68.51
20.6	18.633	82.62	10.975	27.49	04.620	66.97
30.6	18.468	80.33	10.925	26.16	04.536	65.15
June 9.6	18.356	77.74	10.913	24.66	04.492	63.07
19.5	18.299	74.90	10.938	23.03	04.480	60.79
29.5	18.298	71.89	11.001	21.30	04.527	58.37
July 9.5	18.354	68.79	11.100	19.53	04.605	55.88
19.5	18.466	65.71	11.233	17.76	04.722	53.40
29.4	18.631	62.73	11.396	16.06	04.875	51.00
Aug. 8.4	18.846	59.94	11.588	14.50	05.062	48.76
18.4	19.107	57.45	11.805	13.13	05.280	46.77
28.4	19.409	55.34	12.044	12.02	05.524	45.10
Sept. 7.3	19.746	53.70	12.301	11.21	05.792	43.82
17.3	20.111	52.60	12.574	10.76	06.079	43.00
27.3	20.496	52.10	12.859	10.70	06.382	42.68
Oct. 7.2	20.894	52.22	13.152	11.05	06.694	42.88
17.2	21.294	52.98	13.450	11.80	07.012	43.63
27.2	21.688	54.37	13.746	12.95	07.328	44.90
Nov. 6.2	22.063	56.35	14.038	14.45	07.637	46.65
16.1	22.411	58.87	14.317	16.26	07.931	48.84
26.1	22.720	61.82	14.577	18.31	08.203	51.40
Dec. 6.1	22.982	65.13	14.812	20.54	08.444	54.22
16.1	23.187	68.67	15.013	22.86	08.647	57.22
26.0	23.329	72.32	15.176	25.20	08.806	60.30
35.9	23.402	75.99	15.294	27.47	08.915	63.36
Mean Place	19.279	70.52	10.133	21.19	04.187	56.97
Sec δ , Tan δ	1.573	-1.215	1.022	-0.212	1.142	-0.552
a, a'	+1.5	-4.2	+2.8	-4.4	+2.4	-4.9
b, b'	+0.02	-1.0	0.00	-1.0	+0.01	-1.0
Authority and Catalogue No.	A.N.	419	B.J.	422	B.J.	426

† Second transit, Dec. 35

† First transit, Dec. 36

APPARENT PLACES OF STARS, 1935

405

AT UPPER TRANSIT AT GREENWICH

Name	22 Canis Majoris		ζ Geminorum		ο ^a Canis Majoris	
	3.68	K ₅	Var.	G _{op}	3.12	B _{5p}
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 6 ^m 59	—27° 50′	^h 7 ^m 00	+20° 39′	^h 7 ^m 00	—23° 44′
Jan. 1.0	09.875 ₈₃	23.93 ₂₉₇	17.751 ₁₂₉	63.10 ₂₉	20.721 ₈₉	11.32 ₂₇₉
10.9	09.958 ₃₀	26.90 ₂₈₀	17.880 ₇₇	62.81 ₁₆	20.810 ₃₈	14.11 ₂₆₄
20.9	09.988 ₂₂	29.70 ₂₅₇	17.957 ₂₄	62.65 ₅	20.848 ₁₄	16.75 ₂₄₁
30.9	09.966 ₇₂	32.27 ₂₂₉	17.981 ₂₈	62.60 ₅	20.834 ₆₃	19.16 ₂₁₄
Feb. 9.9	09.894 ₁₁₈	34.56 ₁₉₅	17.953 ₇₅	62.65 ₁₂	20.771 ₁₀₇	21.30 ₁₈₁
19.9	09.776 ₁₅₅	36.51 ₁₅₈	17.878 ₁₁₅	62.77 ₁₆	20.664 ₁₄₄	23.11 ₁₄₇
Mar. 1.9	09.621 ₁₈₄	38.09 ₁₁₉	17.763 ₁₄₅	62.93 ₁₇	20.520 ₁₇₃	24.58 ₁₁₀
11.8	09.437 ₂₀₃	39.28 ₇₈	17.618 ₁₆₆	63.10 ₁₆	20.347 ₁₉₂	25.68 ₇₃
21.8	09.234 ₂₁₂	40.06 ₃₈	17.452 ₁₇₅	63.26 ₁₃	20.155 ₂₀₀	26.41 ₃₅
31.8	09.022 ₂₁₀	40.44 ₂	17.277 ₁₇₄	63.39 ₉	19.955 ₁₉₉	26.76 ₃
Apr. 10.7	08.812 ₁₉₉	40.42 ₄₁	17.103 ₁₆₁	63.48 ₅	19.756 ₁₈₈	26.73 ₃₉
20.7	08.613 ₁₇₉	40.01 ₈₀	16.942 ₁₄₀	63.53 ₁	19.568 ₁₆₉	26.34 ₇₅
30.7	08.434 ₁₅₃	39.21 ₁₁₅	16.802 ₁₁₂	63.54 ₃	19.399 ₁₄₃	25.59 ₁₀₈
May 10.7	08.281 ₁₂₀	38.06 ₁₄₉	16.690 ₇₈	63.51 ₅	19.256 ₁₁₁	24.51 ₁₃₈
20.6	08.161 ₈₄	36.57 ₁₇₇	16.612 ₃₉	63.46 ₆	19.145 ₇₆	23.13 ₁₆₆
30.6	08.077 ₄₅	34.80 ₂₀₃	16.573 _—	63.40 ₇	19.069 ₃₇	21.47 ₁₈₉
June 9.6	08.032 ₄	32.77 ₂₂₂	16.573 ₄₀	63.33 ₇	19.032 ₂	19.58 ₂₀₇
19.6	08.028 ₃₆	30.55 ₂₃₆	16.613 ₇₉	63.26 ₆	19.034 ₄₁	17.51 ₂₂₁
29.5	08.064 ₇₇	28.19 ₂₄₄	16.692 ₁₁₇	63.20 ₅	19.075 ₈₀	15.30 ₂₂₇
July 9.5	08.141 ₁₁₅	25.75 ₂₄₄	16.809 ₁₅₂	63.15 ₆	19.155 ₁₁₆	13.03 ₂₂₇
19.5	08.256 ₁₅₀	23.31 ₂₃₆	16.961 ₁₈₄	63.09 ₈	19.271 ₁₅₁	10.76 ₂₂₀
29.4	08.406 ₁₈₄	20.95 ₂₁₉	17.145 ₂₁₃	63.01 ₁₀	19.422 ₁₈₂	08.56 ₂₀₅
Aug. 8.4	08.590 ₂₁₅	18.76 ₁₉₇	17.358 ₂₃₈	62.91 ₁₅	19.604 ₂₁₂	06.51 ₁₈₂
18.4	08.805 ₂₄₁	16.79 ₁₆₄	17.596 ₂₆₀	62.76 ₂₂	19.816 ₂₃₇	04.69 ₁₅₂
28.4	09.046 ₂₆₅	15.15 ₁₂₆	17.856 ₂₇₈	62.54 ₂₉	20.053 ₂₅₉	03.17 ₁₁₆
Sept. 7.3	09.311 ₂₈₄	13.89 ₈₂	18.134 ₂₉₅	62.25 ₃₉	20.312 ₂₇₉	02.01 ₇₃
17.3	09.595 ₂₉₉	13.07 ₃₃	18.420 ₃₀₈	61.86 ₄₈	20.591 ₂₉₃	01.28 ₂₇
27.3	09.894 ₃₁₀	12.74 ₂₀	18.737 ₃₁₇	61.38 ₅₈	20.884 ₃₀₃	01.01 ₂₃
Oct. 7.3	10.204 ₃₁₆	12.94 ₇₃	19.054 ₃₂₄	60.80 ₆₆	21.187 ₃₀₉	01.24 ₇₃
17.2	10.520 ₃₁₆	13.67 ₁₂₄	19.378 ₃₂₅	60.14 ₇₄	21.496 ₃₀₉	01.97 ₁₂₁
27.2	10.836 ₃₀₈	14.91 ₁₇₃	19.703 ₃₂₂	59.40 ₇₉	21.805 ₃₀₄	03.18 ₁₆₈
Nov. 6.2	11.144 ₂₉₄	16.64 ₂₁₆	20.025 ₃₁₄	58.61 ₇₉	22.109 ₂₉₀	04.86 ₂₀₈
16.1	11.438 ₂₇₃	18.80 ₂₅₂	20.339 ₂₉₆	57.82 ₇₈	22.399 ₂₇₀	06.94 ₂₄₁
26.1	11.711 ₂₄₃	21.32 ₂₇₉	20.635 ₂₇₄	57.04 ₇₂	22.669 ₂₄₂	09.35 ₂₆₆
Dec. 6.1	11.954 ₂₀₆	24.11 ₂₉₇	20.909 ₂₄₁	56.32 ₆₂	22.911 ₂₀₇	12.01 ₂₈₂
16.1	12.160 ₁₆₂	27.08 ₃₀₄	21.150 ₂₀₂	55.70 ₅₁	23.118 ₁₆₆	14.83 ₂₈₈
26.0	12.322 ₁₁₄	30.12 ₃₀₂	21.352 ₁₅₇	55.19 ₃₉	23.284 ₁₁₈	17.71 ₂₈₇
36.0	12.436	33.14	21.509	54.80	23.402	20.58
Mean Place	07.681	26.49	15.229	62.42	18.541	13.71
Secδ, Tanδ	1.131	— 0.528	1.069	+ 0.377	1.092	— 0.440
a, a'	+2.4	— 5.1	+3.6	— 5.2	+2.5	— 5.2
b, b'	+0.01	— 1.0	— 0.01	— 1.0	+0.01	— 1.0
Authority and Catalogue No.	A.N.	427	B.J.	428	A.N.	429

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	γ Canis Majoris		δ Canis Majoris		ζ Geminorum	
	4.07	B5	1.98	F8p	5.31	Mb
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₇ ^m ₀₀	^s ₁₅ ^m ₃₁	^h ₇ ^m ₀₅	^s ₂₆ ^m ₁₇	^h ₇ ^m ₀₉	^s ₁₆ ^m ₁₆
Jan. 1.0	51.176 ⁶	67.16 ²⁴¹	47.012 ⁷	17.16 ²⁹²	40.748 ⁸	15.42 ⁶⁰
10.9	51.274 ⁹⁸	69.57 ²²⁵	47.105 ⁹³	20.08 ²⁷⁷	40.881 ¹³³	14.82 ⁴⁵
20.9	51.322 ⁴⁸	71.82 ²⁰⁵	47.145 ⁴⁰	22.85 ²⁵⁴	40.964 ⁸³	14.37 ³²
30.9	51.321 ¹	73.87 ¹⁷⁹	47.132 ¹³	25.39 ²²⁷	40.996 ³²	14.05 ¹⁹
Feb. 9.9	51.271 ⁵⁰	75.66 ¹⁵¹	47.068 ⁶⁴	27.66 ¹⁹³	40.976 ²⁰	13.86 ⁸
19.9	51.178 ⁹³	77.17 ¹²⁰	46.960 ¹⁰⁸	29.59 ¹⁵⁹	40.910 ⁶⁶	13.78 [—]
Mar. 1.9	51.049 ¹²⁹	78.37 ⁹⁰	46.813 ¹⁴⁷	31.18 ¹⁵⁹	40.805 ¹⁰⁵	13.78 [—]
11.8	50.892 ¹⁵⁷	79.27 ⁹⁰	46.637 ¹⁷⁶	32.38 ¹²⁰	40.666 ¹³⁹	13.83 ⁵
21.8	50.716 ¹⁷⁶	79.84 ⁵⁷	46.440 ¹⁹⁷	33.20 ⁸²	40.508 ¹⁵⁸	13.92 ⁹
31.8	50.533 ¹⁸³	80.10 ²⁶	46.235 ²⁰⁵	33.62 ⁴²	40.338 ¹⁷⁰	14.03 ¹¹
Apr. 10.7	50.349 ¹⁸⁴	80.05 ⁵	46.029 ²⁰⁶	33.64 ²	40.169 ¹⁶⁹	14.15 ¹²
20.7	50.178 ¹⁷¹	79.70 ³⁵	45.834 ¹⁹⁵	33.29 ⁷⁵	40.009 ¹⁶⁰	14.27 ¹²
30.7	50.025 ¹⁵³	79.05 ⁶⁵	45.658 ¹⁷⁶	32.56 ³³	39.870 ¹³⁹	14.39 ¹²
May 10.7	49.899 ¹²⁶	78.13 ⁹²	45.507 ¹⁵¹	31.49 ¹⁰⁷	39.756 ¹¹⁴	14.50 ¹¹
20.6	49.803 ⁹⁶	76.96 ¹¹⁷	45.387 ¹²⁰	30.09 ¹⁴⁰	39.676 ⁸⁰	14.63 ¹³
30.6	49.741 ⁶²	75.56 ¹⁴⁰	45.302 ⁸⁵	28.40 ¹⁶⁹	39.629 ⁴⁷	14.77 ¹⁴
June 9.6	49.717 ²⁴	73.96 ¹⁶⁰	45.256 ⁴⁶	26.46 ¹⁹⁴	39.621 ⁸	14.92 ¹⁵
19.6	49.730 ¹³	72.21 ¹⁷⁵	45.249 ⁷	24.32 ²¹⁴	39.651 ³⁰	15.08 ¹⁶
29.5	49.781 ⁵¹	70.34 ¹⁸⁷	45.280 ³¹	22.03 ²²⁹	39.721 ⁷⁰	15.25 ¹⁷
July 9.5	49.868 ⁸⁷	68.42 ¹⁹²	45.351 ⁷¹	19.67 ²³⁶	39.825 ¹⁰⁴	15.43 ¹⁸
19.5	49.989 ¹²¹	66.51 ¹⁹¹	45.461 ¹¹⁰	17.30 ²³⁷	39.964 ¹³⁹	15.59 ¹⁶
29.4	50.143 ¹⁵⁴	64.67 ¹⁸⁴	45.605 ¹⁴⁴	15.01 ²²⁹	40.134 ¹⁷⁰	15.72 ¹³
Aug. 8.4	50.326 ¹⁸³	62.96 ¹⁷¹	45.783 ¹⁷⁸	12.86 ²¹⁵	40.332 ¹⁹⁸	15.82 ¹⁰
18.4	50.535 ²⁰⁹	61.45 ¹⁵¹	45.990 ²⁰⁷	10.94 ¹⁹²	40.556 ²²⁴	15.84 ²
28.4	50.769 ²³⁴	60.20 ¹²⁵	46.225 ²³⁵	09.33 ¹⁶¹	40.801 ²⁴⁵	15.75 ⁹
Sept. 7.3	51.022 ²⁵³	59.28 ⁹²	46.484 ²⁵⁹	08.08 ¹²⁵	41.068 ²⁶⁷	15.57 ¹⁸
17.3	51.293 ²⁷¹	58.73 ⁵⁵	46.763 ²⁷⁹	07.27 ⁸¹	41.349 ²⁸¹	15.24 ³³
27.3	51.577 ²⁸⁴	58.60 ¹³	47.058 ²⁹⁵	06.93 ³⁴	41.645 ²⁹⁶	14.77 ⁴⁷
Oct. 7.3	51.871 ²⁹⁴	58.89 ²⁹	47.364 ³⁰⁶	07.11 ¹⁸	41.953 ³⁰⁸	14.17 ⁶⁰
17.2	52.172 ³⁰¹	59.63 ⁷⁴	47.678 ³¹⁴	07.81 ⁷⁰	42.268 ³¹⁵	13.42 ⁷⁵
27.2	52.473 ³⁰¹	60.79 ¹¹⁶	47.993 ³¹⁵	07.81 ¹²¹	42.586 ³¹⁸	12.56 ⁸⁶
Nov. 6.2	52.770 ²⁹⁷	62.35 ¹⁵⁶	48.302 ³⁰⁹	09.02 ¹⁶⁸	42.904 ³¹⁸	12.56 ⁹³
16.1	53.056 ²⁸⁶	64.25 ¹⁹⁰	48.599 ²⁹⁷	10.70 ²¹⁰	43.212 ³⁰⁸	11.63 ¹⁰²
26.1	53.323 ²⁶⁷	66.42 ²¹⁷	48.875 ²⁷⁶	12.80 ²⁴⁷	43.508 ²⁹⁶	10.61 ¹⁰¹
Dec. 6.1	53.565 ²⁴²	68.79 ²³⁷	49.124 ²⁴⁹	15.27 ²⁷³	44.024 ²⁷²	09.60 ¹⁰⁰
16.1	53.775 ²¹⁰	71.28 ²⁴⁹	49.337 ²¹³	18.00 ²⁹²	44.389 ²⁴⁴	08.60 ⁹²
26.0	53.945 ¹⁷⁰	73.81 ²⁵³	49.507 ¹⁷⁰	20.92 ²⁹⁹	44.024 ²⁰⁵	07.68 ⁸¹
36.0	54.070 ¹²⁵	76.30 ²⁴⁹	49.629 ¹²²	23.91 ²⁹⁸	44.229 ¹⁶⁰	06.87 ⁶⁹
				26.89 ²⁹⁸		06.18 [—]
Mean Place	48.995	69.16	44.830	19.69	38.305	15.13
Sec δ , Tan δ	1.038	— 0.278	1.115	— 0.494	1.042	+ 0.292
a, a'	+2.7	— 5.3	+2.4	— 5.7	+3.4	— 6.0
b, b'	0.00	— 1.0	+0.01	— 1.0	— 0.01	— 1.0
Authority and Catalogue No.	B.J.	430	B.J.	433	A.E.	439

APPARENT PLACES OF STARS, 1935

407

AT UPPER TRANSIT AT GREENWICH

Name	π Argus		δ Geminorum		δ Volantis	
	2.74	K5	3.52	Fo	4.02	F5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₇ ^m ₁₄	[°] ₋₃₆ ['] ₅₈	^h ₇ ^m ₁₆	[°] ₊₂₂ ['] ₀₆	^h ₇ ^m ₁₆	[°] ₋₆₇ ['] ₅₀
Jan. 1.0	^s _{52.977}	^s _{43.08}	^s _{17.022}	^s _{12.84}	^s _{55.38}	^s _{12.45}
10.9	^s _{53.069} [†] ₉₂	^s _{46.42} [†] ₃₃₄	^s _{17.169} [†] ₁₄₇	^s _{12.59} [†] ₂₅	^s _{55.41} [†] ₃	^s _{16.29} [†] ₃₈₄
20.9	^s _{53.102} [†] ₃₃	^s _{49.63} [†] ₃₂₁	^s _{17.263} [†] ₉₄	^s _{12.48} [†] ₁₁	^s _{55.33} [†] ₈	^s _{20.04} [†] ₃₇₅
30.9	^s _{53.078} [†] ₂₄	^s _{52.62} [†] ₂₉₉	^s _{17.303} [†] ₄₀	^s _{12.51} [†] ₃	^s _{55.13} [†] ₂₀	^s _{23.60} [†] ₃₅₆
Feb. 9.9	^s _{52.998} [†] ₈₀	^s _{55.32} [†] ₂₇₀	^s _{17.289} [†] ₁₄	^s _{12.64} [†] ₁₃	^s _{54.83} [†] ₃₀	^s _{26.88} [†] ₃₂₈
19.9	^s _{52.868} [†] ₁₃₀	^s _{57.67} [†] ₂₃₅	^s _{17.227} [†] ₆₂	^s _{12.85} [†] ₂₁	^s _{54.44} [†] ₃₉	^s _{29.80} [†] ₂₉₂
Mar. 1.9	^s _{52.696} [†] ₁₇₂	^s _{59.63} [†] ₁₉₆	^s _{17.122} [†] ₁₀₅	^s _{13.11} [†] ₂₆	^s _{53.98} [†] ₄₆	^s _{32.30} [†] ₂₅₀
11.8	^s _{52.491} [†] ₂₀₅	^s _{61.17} [†] ₁₅₄	^s _{16.984} [†] ₁₃₈	^s _{13.37} [†] ₂₆	^s _{53.45} [†] ₅₃	^s _{34.33} [†] ₂₀₃
21.8	^s _{52.263} [†] ₂₂₈	^s _{62.27} [†] ₁₁₀	^s _{16.823} [†] ₁₆₁	^s _{13.62} [†] ₂₅	^s _{52.87} [†] ₅₈	^s _{35.54} [†] ₁₅₂
31.8	^s _{52.023} [†] ₂₄₀	^s _{62.91} [†] ₆₄	^s _{16.649} [†] ₁₇₄	^s _{13.83} [†] ₂₁	^s _{52.28} [†] ₅₉	^s _{36.86} [†] ₁₀₁
Apr. 10.8	^s _{51.780} [†] ₂₄₃	^s _{63.09} [†] ₁₈	^s _{16.475} [†] ₁₇₄	^s _{13.98} [†] ₁₅	^s _{51.67} [†] ₆₁	^s _{37.31} [†] ₄₅
20.7	^s _{51.547} [†] ₂₃₃	^s _{62.83} [†] ₂₆	^s _{16.309} [†] ₁₆₆	^s _{14.08} [†] ₁₀	^s _{51.08} [†] ₅₉	^s _{37.24} [†] ₇
30.7	^s _{51.332} [†] ₂₁₅	^s _{62.13} [†] ₇₀	^s _{16.163} [†] ₁₄₆	^s _{14.11} [†] ₃	^s _{50.51} [†] ₅₇	^s _{36.65} [†] ₅₉
May 10.7	^s _{51.142} [†] ₁₉₀	^s _{61.01} [†] ₁₁₂	^s _{16.042} [†] ₁₂₁	^s _{14.08} [†] ₃	^s _{49.98} [†] ₅₃	^s _{33.95} [†] ₁₁₁
20.6	^s _{50.983} [†] ₁₅₉	^s _{59.51} [†] ₁₅₀	^s _{15.953} [†] ₈₉	^s _{14.01} [†] ₇	^s _{49.51} [†] ₄₇	^s _{33.95} [†] ₁₅₉
30.6	^s _{50.862} [†] ₁₂₁	^s _{57.66} [†] ₁₈₅	^s _{15.901} [†] ₅₂	^s _{13.90} [†] ₁₁	^s _{49.10} [†] ₄₁	^s _{31.94} [†] ₂₀₁
June 9.6	^s _{50.781} [†] ₈₁	^s _{55.50} [†] ₂₁₆	^s _{15.888} [†] ₁₃	^s _{13.76} [†] ₁₄	^s _{48.77} [†] ₃₃	^s _{29.53} [†] ₂₄₁
19.6	^s _{50.742} [†] ₃₂	^s _{53.10} [†] ₂₄₀	^s _{15.914} [†] ₂₆	^s _{13.61} [†] ₁₅	^s _{48.52} [†] ₂₅	^s _{26.81} [†] ₂₇₂
29.5	^s _{50.745} [†] ₃	^s _{50.52} [†] ₂₅₈	^s _{15.978} [†] ₆₄	^s _{13.43} [†] ₁₈	^s _{48.37} [†] ₁₅	^s _{23.84} [†] ₂₉₇
July 9.5	^s _{50.793} [†] ₄₈	^s _{47.83} [†] ₂₆₉	^s _{16.080} [†] ₁₀₂	^s _{13.25} [†] ₁₈	^s _{48.30} [†] ₇	^s _{20.71} [†] ₃₁₃
19.5	^s _{50.884} [†] ₉₁	^s _{45.11} [†] ₂₇₂	^s _{16.218} [†] ₁₃₈	^s _{13.05} [†] ₂₀	^s _{48.33} [†] ₃	^s _{17.51} [†] ₃₂₀
29.5	^s _{51.015} [†] ₁₃₁	^s _{42.45} [†] ₂₆₆	^s _{16.389} [†] ₁₇₁	^s _{12.82} [†] ₂₃	^s _{48.46} [†] ₁₃	^s _{14.33} [†] ₃₁₈
Aug. 8.4	^s _{51.186} [†] ₁₇₁	^s _{39.94} [†] ₂₅₁	^s _{16.588} [†] ₁₉₉	^s _{12.56} [†] ₂₆	^s _{48.68} [†] ₂₂	^s _{11.29} [†] ₃₀₄
18.4	^s _{51.393} [†] ₂₀₇	^s _{37.66} [†] ₂₂₈	^s _{16.815} [†] ₂₂₇	^s _{12.25} [†] ₃₁	^s _{48.99} [†] ₃₁	^s _{08.47} [†] ₂₈₂
28.4	^s _{51.633} [†] ₂₄₀	^s _{35.69} [†] ₁₉₇	^s _{17.065} [†] ₂₅₀	^s _{11.88} [†] ₃₇	^s _{49.39} [†] ₄₀	^s _{05.99} [†] ₂₄₈
Sept. 7.3	^s _{51.902} [†] ₂₆₉	^s _{34.13} [†] ₁₅₆	^s _{17.336} [†] ₂₇₁	^s _{11.44} [†] ₄₄	^s _{49.86} [†] ₄₇	^s _{03.93} [†] ₂₀₆
17.3	^s _{52.197} [†] ₂₉₅	^s _{33.04} [†] ₁₀₉	^s _{17.626} [†] ₂₉₀	^s _{10.91} [†] ₅₃	^s _{50.38} [†] ₅₂	^s _{02.39} [†] ₁₅₄
27.3	^s _{52.513} [†] ₃₁₆	^s _{32.48} [†] ₅₆	^s _{17.930} [†] ₃₀₄	^s _{10.29} [†] ₆₂	^s _{50.96} [†] ₅₈	^s _{01.43} [†] ₉₆
Oct. 7.3	^s _{52.844} [†] ₃₃₁	^s _{32.48} [†] _—	^s _{18.247} [†] ₃₁₇	^s _{09.59} [†] ₇₀	^s _{51.58} [†] ₆₂	^s _{01.09} [†] ₃₄
17.2	^s _{53.184} [†] ₃₄₀	^s _{33.07} [†] ₅₉	^s _{18.573} [†] ₃₂₆	^s _{08.81} [†] ₇₈	^s _{52.20} [†] ₆₂	^s _{01.43} [†] ₃₄
27.2	^s _{53.525} [†] ₃₄₁	^s _{34.23} [†] ₁₁₆	^s _{18.904} [†] ₃₃₁	^s _{07.98} [†] ₈₃	^s _{52.83} [†] ₆₃	^s _{02.43} [†] ₁₀₀
Nov. 6.2	^s _{53.861} [†] ₃₃₆	^s _{35.94} [†] ₁₇₁	^s _{19.234} [†] ₃₃₀	^s _{07.11} [†] ₈₇	^s _{53.43} [†] ₆₀	^s _{04.08} [†] ₁₆₅
16.2	^s _{54.183} [†] ₃₂₂	^s _{38.16} [†] ₂₂₂	^s _{19.558} [†] ₃₂₄	^s _{06.25} [†] ₈₆	^s _{53.98} [†] ₅₅	^s _{06.33} [†] ₂₂₅
26.1	^s _{54.482} [†] ₂₉₉	^s _{40.80} [†] ₂₆₄	^s _{19.867} [†] ₃₀₉	^s _{05.44} [†] ₈₁	^s _{54.48} [†] ₅₀	^s _{09.10} [†] ₂₇₇
Dec. 6.1	^s _{54.748} [†] ₂₆₆	^s _{43.78} [†] ₂₉₈	^s _{20.155} [†] ₂₈₈	^s _{04.69} [†] ₇₅	^s _{54.89} [†] ₄₁	^s _{12.31} [†] ₃₂₁
16.1	^s _{55.279} [†] ₂₂₆	^s _{50.35} [†] ₃₂₂	^s _{20.412} [†] ₂₅₇	^s _{03.56} [†] ₆₃	^s _{55.21} [†] ₃₂	^s _{15.85} [†] ₃₅₄
26.0	^s _{55.279} [†] ₁₇₉	^s _{53.73} [†] ₃₃₅	^s _{20.632} [†] ₂₂₀	^s _{03.20} [†] ₅₀	^s _{55.43} [†] ₂₂	^s _{19.60} [†] ₃₇₅
36.0	^s _{55.279} [†] ₁₂₆	^s _{53.73} [†] ₃₃₈	^s _{20.806} [†] ₁₇₄	^s _{03.20} [†] ₃₆	^s _{55.53} [†] ₁₀	^s _{23.45} [†] ₃₈₅
Mean Place	50.745	46.38	14.482	13.21	52.072	17.56
Sec δ , Tan δ	1.252	- 0.753	1.679	+ 0.406	2.651	- 2.455
a, a'	+2.1	- 6.4	+3.6	- 6.5	0.0	- 6.6
b, b'	+0.02	- 0.9	-0.01	- 0.9	+0.05	- 0.9
Authority and Catalogue No.	B.J.	445	B.J.	447	B.J.	449

† Second transit, Jan. 10

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	η Canis Majoris		β Canis Minoris		σ Argus	
Mag. Spect.	2.43	B5p	3.09	B8	3.28	K5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 7 ^m 21	— 29° 10'	^h 7 ^m 23	+ 8° 25'	^h 7 ^m 27	— 43° 09'
Jan. 1.0	33.498	28.04	39.850	18.61	12.282	64.02
11.0	33.606 [†]	31.12	39.991	17.48	12.384	67.57
20.9	33.659	34.07	40.082	16.50	12.422	71.01
30.9	33.659	36.81	40.122	15.69	12.397	74.25
Feb. 9.9	33.606	39.28	40.113	15.04	12.312	77.22
19.9	33.505	41.44	40.058	14.56	12.172	79.84
Mar. 1.9	33.363	43.23	39.962	14.24	11.986	82.07
11.8	33.189	44.63	39.835	14.04	11.761	83.86
21.8	32.993	45.63	39.685	13.96	11.511	85.20
31.8	32.784	46.23	39.523	13.98	11.244	86.05
Apr. 10.8	32.572	46.41	39.357	14.09	10.973	86.43
20.7	32.368	46.19	39.201	14.28	10.709	86.33
30.7	32.180	45.58	39.060	14.54	10.460	85.75
May 10.7	32.015	44.59	38.943	14.87	10.235	84.72
20.6	31.879	43.26	38.854	15.26	10.042	83.27
30.6	31.777	41.62	38.799	15.72	09.885	81.44
June 9.6	31.712	39.70	38.778	16.23	09.770	79.26
19.6	31.685	37.56	38.793	16.78	09.700	76.81
29.5	31.608	35.25	38.844	17.36	09.675	74.15
July 9.5	31.751	32.84	38.930	17.95	09.698	71.34
19.5	31.842	30.41	39.048	18.53	09.768	68.48
29.5	31.970	28.03	39.198	19.07	09.883	65.65
Aug. 8.4	32.133	25.77	39.375	19.53	10.042	62.94
18.4	32.328	23.73	39.578	19.89	10.243	60.45
28.4	32.553	21.98	39.804	20.11	10.484	58.28
Sept. 7.3	32.805	20.60	40.051	20.15	10.759	56.50
17.3	33.080	19.65	40.316	20.01	11.065	55.19
27.3	33.374	19.19	40.597	19.64	11.396	54.43
Oct. 7.3	33.683	19.24	40.889	19.06	11.747	54.25
17.2	34.002	19.83	41.193	18.26	12.109	54.68
27.2	34.325	20.96	41.502	17.26	12.476	55.72
Nov. 6.2	34.645	22.59	41.812	16.09	12.839	57.35
16.2	34.955	24.68	42.117	14.78	13.187	59.52
26.1	35.246	27.16	42.409	13.40	13.512	62.17
Dec. 6.1	35.509	29.94	42.681	11.97	13.802	65.20
16.1	35.738	32.93	42.925	10.57	14.049	68.52
26.0	35.925	36.04	43.134	09.24	14.244	72.01
36.0	36.063	39.17	43.300	08.02	14.382	75.58
Mean Place	31.331	30.93	37.530	18.56	10.004	68.07
Secδ, Tanδ	1.145	— 0.558	1.011	+ 0.148	1.371	— 0.938
a, a'	+2.4	— 7.0	+3.3	— 7.2	+1.9	— 7.4
b, b'	+0.01	— 0.9	0.00	— 0.9	+0.02	— 0.9
Authority and Catalogue No.	A.N.	452	B.J.	453	A.N.	457

† First transit, Jan. 11

APPARENT PLACES OF STARS, 1935

409

AT UPPER TRANSIT AT GREENWICH

Name	α^2 Geminorum (<i>Castor</i>)		ζ Carinae		α Canis Minoris (<i>Procyon</i>)	
Mag. Spect.	1.99	Ao	4.92	K5	0.48	F5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₇ ^m ₃₀	[°] ₊₃₂ ['] ₀₁	^h ₇ ^m ₃₄	[°] ₋₅₂ ['] ₂₃	^h ₇ ^m ₃₅	[°] ₊₅ ['] ₂₃
Jan. 1.0	30.033	56.45	05.684	12.22	56.294	33.36
11.0	30.207 ¹⁷⁴	56.77 ³²	05.787 ¹⁰³	15.97 ³⁷⁵	56.439 ¹⁴⁵	31.98 ¹³⁸
20.9	30.323 ¹⁴	57.24 ¹¹⁶	05.815 ²⁸	19.65 ³⁶⁸	56.535 ⁹⁶	30.76 ¹²²
30.9	30.380 ⁵⁷	57.84 ⁶⁰	05.769 ⁴⁶	23.16 ³⁵¹	56.581 ⁴⁶	29.72 ¹⁰⁴
Feb. 9.9	30.378 ²	58.54 ⁷⁰	05.654 ¹¹⁵	26.40 ³²⁴	56.576 ⁵	28.87 ⁸⁵
19.9	30.323 ⁵⁵	59.27 ⁷³	05.474 ¹⁸⁰	29.31 ²⁹¹	56.525 ⁵¹	28.20 ⁶⁷
Mar. 1.9	30.219 ¹⁰⁴	59.99 ⁷²	05.241 ²³³	31.81 ²⁵⁰	56.434 ⁹¹	27.72 ⁴⁸
11.8	30.076 ¹⁴³	60.64 ⁶⁵	04.963 ²⁷⁸	33.87 ²⁰⁶	56.311 ¹²³	27.39 ³³
21.8	29.905 ¹⁷¹	61.20 ⁵⁶	04.653 ³¹⁰	35.45 ¹⁵⁸	56.163 ¹⁴⁸	27.22 ¹⁷
31.8	29.718 ¹⁸⁷	61.62 ⁴²	04.322 ³³¹	36.53 ¹⁰⁸	56.003 ¹⁶⁰	27.18 ⁴
Apr. 10.8	29.524 ¹⁹⁴	61.87 ²⁵	03.984 ³³⁸	37.10 ⁵⁷	55.839 ¹⁶⁴	27.25 ⁷
20.7	29.340 ¹⁸⁴	61.97 ¹⁰	03.650 ³³⁴	37.15 ⁵	55.681 ¹⁵⁸	27.43 ¹⁸
30.7	29.172 ¹⁶⁸	61.91 ⁶	03.333 ³¹⁷	36.69 ⁴⁶	55.538 ¹⁴³	27.71 ²⁸
May 10.7	29.030 ¹⁴²	61.68 ²³	03.040 ²⁹³	35.74 ⁹⁵	55.416 ¹²²	28.08 ³⁷
20.7	28.921 ¹⁰⁹	61.31 ³⁷	02.781 ²⁵⁹	34.34 ¹⁴⁰	55.321 ⁹⁵	28.53 ⁴⁵
30.6	28.850 ⁷¹	60.82 ⁴⁹	02.563 ²¹⁸	32.51 ¹⁸³	55.258 ⁶³	29.06 ⁵³
June 9.6	28.818 ³²	60.22 ⁶⁰	02.391 ¹⁷²	30.31 ²²⁰	55.229 ²⁹	29.66 ⁶⁰
19.6	28.830 ¹²	59.54 ⁶⁸	02.270 ¹²¹	27.78 ²⁵³	55.235 ⁶	30.30 ⁶⁴
29.5	28.883 ⁵³	58.79 ⁷⁵	02.203 ⁶⁷	25.01 ²⁷⁷	55.275 ⁴⁰	30.99 ⁶⁹
July 9.5	28.977 ⁹⁴	57.99 ⁸⁰	02.192 ¹¹	22.07 ²⁹⁴	55.349 ⁷⁴	31.68 ⁶⁹
19.5	29.110 ¹³³	57.16 ⁸³	02.238 ⁴⁶	19.04 ³⁰³	55.457 ¹⁰⁸	32.36 ⁶⁸
29.5	29.279 ¹⁶⁹	56.31 ⁸⁵	02.340 ¹⁰²	16.02 ³⁰²	55.594 ¹³⁷	32.99 ⁶³
Aug. 8.4	29.480 ²⁰¹	55.43 ⁸⁸	02.496 ¹⁵⁶	13.11 ²⁹¹	55.760 ¹⁶⁶	33.54 ⁵⁵
18.4	29.711 ²³¹	54.53 ⁹⁰	02.706 ²¹⁰	10.40 ²⁷¹	55.951 ¹⁹¹	33.97 ⁴³
28.4	29.971 ²⁶⁰	53.62 ⁹¹	02.964 ²⁵⁸	07.99 ²⁴¹	56.167 ²¹⁶	34.24 ²⁷
Sept. 7.4	30.255 ²⁸⁴	52.69 ⁹³	03.268 ³⁰⁴	05.99 ²⁰⁰	56.403 ²³⁶	34.33 ⁹
17.3	30.561 ³⁰⁶	51.75 ⁹⁴	03.611 ³⁴³	04.47 ¹⁵²	56.660 ²⁵⁷	34.19 ¹⁴
27.3	30.885 ³²⁴	50.81 ⁹⁴	03.987 ³⁷⁶	03.49 ⁹⁸	56.933 ²⁷³	33.82 ³⁷
Oct. 7.3	31.224 ³³⁹	49.88 ⁹³	04.389 ⁴⁰²	03.13 ³⁶	57.220 ²⁸⁷	33.18 ⁶⁴
17.2	31.576 ³⁵²	48.97 ⁹¹	04.806 ⁴¹⁷	03.41 ²⁸	57.519 ²⁹⁹	32.31 ⁸⁷
27.2	31.935 ³⁵⁹	48.12 ⁸⁵	05.229 ⁴²³	04.33 ⁹²	57.824 ³⁰⁵	31.21 ¹¹⁰
Nov. 6.2	32.296 ³⁶¹	47.34 ⁷⁸	05.645 ⁴¹⁶	05.89 ¹⁵⁶	58.132 ³⁰⁸	29.91 ¹³⁰
16.2	32.652 ³⁵⁶	46.65 ⁶⁹	06.045 ⁴⁰⁰	08.02 ²¹³	58.435 ³⁰³	29.91 ¹⁴⁶
26.1	32.996 ³⁴⁴	46.12 ⁵³	06.415 ³⁷⁰	10.68 ²⁶⁶	58.726 ²⁹¹	28.45 ¹⁵⁸
Dec. 6.1	33.316 ³²⁰	45.74 ³⁸	06.743 ³²⁸	13.78 ³¹⁰	59.000 ²⁷⁴	25.24 ¹⁶³
16.1	33.607 ²⁹¹	45.55 ¹⁹	07.020 ²⁷⁷	17.20 ³⁴²	59.246 ²⁴⁶	23.61 ¹⁶³
26.1	33.858 ²⁵¹	45.55 [—]	07.235 ²¹⁵	20.85 ³⁶⁵	59.458 ²¹²	22.03 ¹⁵⁸
36.0	34.061 ²⁰³	45.75 ²⁰	07.381 ¹⁴⁶	24.60 ³⁷⁵	59.628 ¹⁷⁰	20.56 ¹⁴⁷
Mean Place	27.223	57.01	03.241	17.17	53.964	34.40
Secδ, Tanδ	1.180	+ 0.626	1.639	- 1.298	1.004	+ 0.094
a, a'	+3.8	- 7.7	+1.5	- 8.0	+3.2	- 8.1
b, b'	-0.02	- 0.9	+0.03	- 0.9	0.00	- 0.9
Authority and Catalogue No.	A.E.	458	N.A.	463	A.E.	466

No. 458. The reductions from *c.g.* to brighter star (α^2) vary during the year from $+0^{\circ}.048$, $+1^{\circ}.35$ to $+0^{\circ}.044$, $+1^{\circ}.31$. The mean place is that of *c.g.*

No. 466. Corrected for a parallax of $0^{\circ}.31$. The reductions from *c.g.* to brighter star vary during the year from $+0^{\circ}.055$, $-0^{\circ}.72$ to $+0^{\circ}.051$, $-0^{\circ}.85$. The mean place is that of *c.g.*

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	26 Monocerotis		β Geminorum (<i>Pollux</i>)		ξ Argus	
Mag. Spect.	4.07	Ko	1.21	Ko	3.47	Gop
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 7 ^m 38	[°] — 9 23	^h 7 ^m 41	[°] +28 10	^h 7 ^m 46	[°] —24 41
Jan. 1.0	10.594 ¹⁴⁰	52.50 ²²¹	23.060 ¹⁷⁹	62.67 ³	35.657 ¹³⁸	41.17 ²⁹⁶
11.0	10.734 ¹⁶ ⁹²	54.71 ²⁰⁶	23.239 ¹²⁴	62.70 ²¹	35.795 ⁸⁷	44.13 ²⁸⁴
20.9	10.826 ⁴¹	56.77 ¹⁸⁷	23.363 ⁶⁷	62.91 ³⁷	35.882 ³⁴	46.97 ²⁶⁶
30.9	10.867 ⁸	58.64 ¹⁶⁵	23.430 ¹⁰	63.28 ⁴⁸	35.916 ¹⁹	49.63 ²⁴³
Feb. 9.9	10.859 ⁵⁴	60.29 ¹⁴¹	23.440 ⁴⁴	63.76 ⁵⁵	35.897 ⁶⁷	52.06 ²¹³
19.9	10.805 ⁹⁵	61.70 ¹¹⁴	23.396 ⁹²	64.31 ⁵⁹	35.830 ¹¹⁰	54.19 ¹⁸⁰
Mar. 1.9	10.710 ¹²⁷	62.84 ⁸⁶	23.304 ¹³⁰	64.90 ⁵⁶	35.720 ¹⁴⁵	55.99 ¹⁴⁵
11.9	10.583 ¹⁵¹	63.70 ⁶⁰	23.174 ¹⁵⁹	65.46 ⁵²	35.575 ¹⁷¹	57.44 ¹⁰⁹
21.8	10.432 ¹⁶⁵	64.30 ³⁴	23.015 ¹⁷⁶	65.98 ⁴²	35.404 ¹⁸⁷	58.53 ⁷¹
31.8	10.267 ¹⁷⁰	64.64 ⁸	22.839 ¹⁸⁴	66.40 ³¹	35.217 ¹⁹³	59.24 ³³
Apr. 10.8	10.097 ¹⁶⁴	64.72 ¹⁷	22.655 ¹⁷⁸	66.71 ¹⁸	35.024 ¹⁹⁰	59.57 ⁴
20.7	09.933 ¹⁵¹	64.55 ⁴¹	22.477 ¹⁶³	66.89 ⁵	34.834 ¹⁷⁸	59.53 ⁴⁰
30.7	09.782 ¹³²	64.14 ⁶⁴	22.314 ¹⁴⁰	66.94 ⁸	34.656 ¹⁶⁰	59.13 ⁷⁴
May 10.7	09.650 ¹⁰⁶	63.50 ⁸⁴	22.174 ¹¹¹	66.86 ¹⁹	34.496 ¹³⁵	58.39 ¹⁰⁷
20.7	09.544 ⁷⁶	62.66 ¹⁰³	22.063 ⁷⁶	66.67 ³¹	34.361 ¹⁰⁶	57.32 ¹³⁸
30.6	09.468 ⁴⁴	61.63 ¹²⁰	21.987 ³⁷	66.36 ³⁹	34.255 ⁷²	55.94 ¹⁶³
June 9.6	09.424 ⁹	60.43 ¹³⁴	21.950 ¹	65.97 ⁴⁷	34.183 ³⁸	54.31 ¹⁸⁵
19.6	09.415 ²⁵	59.09 ¹⁴⁴	21.951 ⁴¹	65.50 ⁵²	34.145 ²	52.46 ²⁰³
29.6	09.440 ⁵⁹	57.65 ¹⁵⁰	21.992 ⁷⁹	64.98 ⁵⁹	34.143 ³⁵	50.43 ²¹⁴
July 9.5	09.499 ⁹¹	56.15 ¹⁵¹	22.071 ¹¹⁶	64.39 ⁶³	34.178 ⁷¹	48.29 ²¹⁹
19.5	09.590 ¹²³	54.64 ¹⁴⁶	22.187 ¹⁵¹	63.76 ⁶⁸	34.249 ¹⁰⁵	46.10 ²¹⁶
29.5	09.713 ¹⁵³	53.18 ¹³⁷	22.338 ¹⁸³	63.08 ⁷²	34.354 ¹³⁰	43.94 ²⁰⁷
Aug. 8.4	09.866 ¹⁸⁰	51.81 ¹²¹	22.521 ²¹²	62.36 ⁷⁶	34.493 ¹⁷⁰	41.87 ¹⁸⁹
18.4	10.046 ²⁰⁵	50.60 ¹⁰⁰	22.733 ²⁴⁰	61.60 ⁸⁰	34.663 ²⁰¹	39.98 ¹⁶⁴
28.4	10.251 ²²⁹	49.60 ⁷³	22.973 ²⁶⁴	60.80 ⁸⁵	34.864 ²²⁹	38.34 ¹³¹
Sept. 7.4	10.480 ²⁵⁰	48.87 ⁴¹	23.237 ²⁸⁷	59.95 ⁹⁰	35.093 ²⁵⁴	37.03 ⁹³
17.3	10.730 ²⁶⁸	48.46 ⁶	23.524 ³⁰⁶	59.05 ⁹⁴	35.347 ²⁷⁶	36.10 ⁴⁸
27.3	10.998 ²⁸⁴	48.40 ³¹	23.830 ³²²	58.11 ⁹⁷	35.623 ²⁹⁴	35.62 [—]
Oct. 7.3	11.282 ²⁹⁵	48.71 ⁷⁰	24.152 ³³⁶	57.14 ⁹⁹	35.917 ³⁰⁸	35.62 ⁵⁰
17.3	11.577 ³⁰³	49.41 ¹⁰⁷	24.488 ³⁴⁶	56.15 ⁹⁸	36.225 ³¹⁸	36.12 ¹⁰⁰
27.2	11.880 ³⁰⁶	50.48 ¹⁴³	24.834 ³⁴⁹	55.17 ⁹⁵	36.543 ³²⁰	37.12 ¹⁴⁹
Nov. 6.2	12.186 ³⁰¹	51.91 ¹⁷⁴	25.183 ³⁴⁷	54.22 ⁸⁸	36.863 ³¹⁵	38.61 ¹⁹³
16.2	12.487 ²⁸⁹	53.65 ¹⁹⁹	25.530 ³³⁶	53.34 ⁷⁷	37.178 ³⁰²	40.54 ²³⁰
26.1	12.776 ²⁷⁰	55.64 ²¹⁶	25.866 ³¹⁸	52.57 ⁶⁴	37.480 ²⁸¹	42.84 ²⁶¹
Dec. 6.1	13.046 ²⁴³	57.80 ²²⁷	26.184 ²⁸⁹	51.93 ⁴⁷	37.761 ²⁵¹	45.45 ²⁸³
16.1	13.289 ²⁰⁸	60.07 ²³¹	26.473 ²⁵²	51.46 ²⁸	38.012 ²¹²	48.28 ²⁹⁵
26.1	13.497 ¹⁶⁷	62.38 ²²⁷	26.725 ²⁰⁷	51.18 ⁹	38.224 ¹⁶⁷	51.23 ²⁹⁸
36.0	13.664	64.65	26.932	51.09	38.391	54.21
Mean Place	08.442	53.64	20.416	65.13	33.548	43.84
Sec δ , Tan δ	1.014	— 0.165	1.135	+ 0.536	1.101	— 0.460
a, a'	+2.9	— 8.3	+3.7	— 8.6	+2.5	— 9.0
b, b'	0.00	— 0.9	— 0.02	— 0.9	+0.01	— 0.9
Authority and Catalogue No.	A.N.	468	B.J.	470	A.N.	475

APPARENT PLACES OF STARS, 1935

411

AT UPPER TRANSIT AT GREENWICH

Name	9 Puppis <i>m.</i>		χ Geminorum		ζ Argus	
	5.34	Go	5.04	Ko	2.27	Od
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 7 ^m 48	—13° 43′	^h 7 ^m 59	+27° 58′	^h 8 ^m 01	—39° 48′
Jan. 1.1	47.762	26.25	34.288	37.39	20.057	63.85
11.0	47.910	28.72	34.487	37.33	20.207	67.36
21.0	48.008	31.05	34.631	37.48	20.296	70.81
30.9	48.056	33.20	34.719	37.80	20.325	74.11
Feb. 9.9	48.054	35.12	34.749	38.27	20.293	77.20
19.9	48.005	36.78	34.724	38.84	20.206	79.98
Mar. 1.9	47.914	38.16	34.650	39.46	20.069	82.42
11.9	47.789	39.24	34.535	40.09	19.891	84.46
21.8	47.639	40.02	34.388	40.68	19.683	86.08
31.8	47.473	40.50	34.220	41.20	19.453	87.25
Apr. 10.8	47.301	40.70	34.043	41.61	19.213	87.97
20.8	47.132	40.61	33.867	41.89	18.972	88.22
30.7	46.974	40.24	33.703	42.04	18.740	88.01
May 10.7	46.835	39.61	33.558	42.06	18.526	87.37
20.7	46.719	38.73	33.440	41.95	18.335	86.29
30.6	46.632	37.63	33.354	41.71	18.174	84.83
June 9.6	46.577	36.34	33.302	41.37	18.048	83.01
19.6	46.554	34.88	33.289	40.93	17.959	80.88
29.6	46.565	33.30	33.312	40.41	17.911	78.50
July 9.5	46.611	31.64	33.373	39.81	17.904	75.94
19.5	46.690	29.96	33.471	39.15	17.939	73.28
29.5	46.800	28.31	33.603	38.43	18.016	70.60
Aug. 8.5	46.941	26.75	33.768	37.65	18.136	67.99
18.4	47.110	25.36	33.963	36.81	18.296	65.54
28.4	47.307	24.19	34.186	35.91	18.496	63.34
Sept. 7.4	47.528	23.29	34.436	34.95	18.732	61.47
17.3	47.773	22.73	34.710	33.93	19.002	60.04
27.3	48.038	22.55	35.006	32.85	19.303	59.09
Oct. 7.3	48.320	22.77	35.321	31.74	19.628	58.69
17.3	48.616	23.41	35.653	30.60	19.973	58.88
27.2	48.922	24.47	35.998	29.46	20.331	59.65
Nov. 6.2	49.231	25.92	36.349	28.36	20.692	61.02
16.2	49.537	27.72	36.701	27.32	21.048	62.93
26.2	49.833	29.82	37.046	26.39	21.389	65.34
Dec. 6.1	50.110	32.13	37.376	25.61	21.705	68.16
16.1	50.361	34.59	37.679	25.01	21.985	71.31
26.1	50.577	37.12	37.948	24.60	22.221	74.68
36.0	50.751	39.64	38.174	24.41	22.404	78.17
Mean Place	45.648	27.70	31.685	41.13	17.909	68.42
Secδ, Tanδ	1.029	— 0.244	1.132	+ 0.531	1.302	— 0.834
<i>a</i> , <i>a'</i>	+2.8	— 9.2	+3.7	—10.0	+2.1	—10.1
<i>b</i> , <i>b'</i>	+0.01	— 0.9	—0.02	— 0.9	+0.03	— 0.9
Authority and Catalogue No.	A.N.	478	B.J.	489	B.J.	492

§ Transit, Jan. 20

† First transit, Jan. 21

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ρ Argus		γ Argus		20 Puppis	
	2.88	F5	1.92	Oap	5.05	G5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	$8^{\text{h}} 04^{\text{m}}$	$-24^{\circ} 06'$	$8^{\text{h}} 07^{\text{m}}$	$-47^{\circ} 08'$	$8^{\text{h}} 10^{\text{m}}$	$-15^{\circ} 35'$
Jan. 1.1	48.537 ¹⁵⁹	54.14 ²⁹⁶	33.890 ¹⁵⁸	33.50 ³⁶⁸	22.697 ¹⁶⁸	26.65 ²⁵⁸
11.0	48.696 ¹⁰⁷	57.10 ²⁸⁶	34.048 ⁹¹	37.18 ³⁶⁶	22.865 ¹²⁰	29.23 ²⁴⁸
21.0	48.803 ⁵⁴	59.96 ²⁷⁰	34.139 ²³	40.84 ³⁵⁵	22.985 ⁶⁸	31.71 ²³⁰
30.9	48.857 ¹	62.66 ²⁴⁸	34.162 ⁴³	44.39 ³³³	23.053 ¹⁷	34.01 ²⁰⁹
Feb. 9.9	48.858 ⁴⁹	65.14 ²²⁰	34.119 ¹⁰⁵	47.72 ³⁰⁵	23.070 ³²	36.10 ¹⁸²
19.9	48.809 ⁹²	67.34 ¹⁸⁸	34.014 ¹⁶⁰	50.77 ²⁷⁰	23.038 ⁷⁵	37.92 ¹⁵⁴
Mar. 1.9	48.717 ¹³⁰	69.22 ¹⁵⁵	33.854 ²⁰⁵	53.47 ²³⁰	22.963 ¹¹¹	39.46 ¹²⁵
11.9	48.587 ¹⁵⁹	70.77 ¹¹⁹	33.649 ²⁴¹	55.77 ¹⁸⁶	22.852 ¹⁴⁰	40.71 ⁹³
21.8	48.428 ¹⁷⁶	71.96 ⁸³	33.408 ²⁶⁶	57.63 ¹³⁹	22.712 ¹⁵⁸	41.64 ⁶³
31.8	48.252 ¹⁸⁷	72.79 ⁴⁵	33.142 ²⁷⁸	59.02 ⁹¹	22.554 ¹⁶⁸	42.27 ³³
Apr. 10.8	48.065 ¹⁸⁶	73.24 ¹⁰	32.864 ²⁸²	59.93 ⁴²	22.386 ¹⁶⁸	42.60 ²
20.8	47.879 ¹⁷⁷	73.34 ²⁷	32.582 ²⁷⁴	60.35 ⁶	22.218 ¹⁶¹	42.62 ²⁶
30.7	47.702 ¹⁶¹	73.07 ⁶¹	32.308 ²⁵⁷	60.29 ⁵⁶	22.057 ¹⁴⁵	42.36 ⁵⁴
May 10.7	47.541 ¹⁴⁰	72.46 ⁹³	32.051 ²³⁴	59.73 ¹⁰¹	21.912 ¹²⁵	41.82 ⁸¹
20.7	47.401 ¹¹³	71.53 ¹²⁴	31.817 ²⁰²	58.72 ¹⁴⁴	21.787 ⁹⁹	41.01 ¹⁰⁴
30.7	47.288 ⁸²	70.29 ¹⁵⁰	31.615 ¹⁶⁵	57.28 ¹⁸⁴	21.688 ⁷¹	39.97 ¹²⁵
June 9.6	47.206 ⁵⁰	68.79 ¹⁷⁴	31.450 ¹²⁶	55.44 ²¹⁸	21.617 ⁴⁰	38.72 ¹⁴⁴
19.6	47.156 ¹⁶	67.05 ¹⁹¹	31.324 ⁸²	53.26 ²⁴⁶	21.577 ⁹	37.28 ¹⁵⁹
29.6	47.140 ¹⁸	65.14 ²⁰⁵	31.242 ³⁴	50.80 ²⁶⁸	21.568 ²⁵	35.69 ¹⁶⁷
July 9.5	47.158 ⁵⁴	63.09 ²¹⁰	31.208 ¹³	48.12 ²⁸¹	21.593 ⁵⁷	34.02 ¹⁷¹
19.5	47.212 ⁸⁷	60.99 ²¹¹	31.221 ⁶¹	45.31 ²⁸⁷	21.650 ⁸⁹	32.31 ¹⁷⁰
29.5	47.299 ¹²¹	58.88 ²⁰²	31.282 ¹¹¹	42.44 ²⁸¹	21.739 ¹¹⁹	30.61 ¹⁶²
Aug. 8.5	47.420 ¹⁵³	56.86 ¹⁸⁷	31.393 ¹⁵⁸	39.63 ²⁶⁷	21.858 ¹⁵⁰	28.99 ¹⁴⁸
18.4	47.573 ¹⁸⁴	54.99 ¹⁶⁴	31.551 ²⁰⁴	36.96 ²⁴³	22.008 ¹⁷⁸	27.51 ¹²⁷
28.4	47.757 ²¹⁴	53.35 ¹³⁴	31.755 ²⁴⁸	34.53 ²⁰⁹	22.186 ²⁰⁶	26.24 ⁹⁹
Sept. 7.4	47.971 ²⁴¹	52.01 ⁹⁷	32.003 ²⁸⁸	32.44 ¹⁶⁷	22.392 ²³¹	25.25 ⁶⁷
17.4	48.212 ²⁶⁵	51.04 ⁵⁴	32.291 ³²⁴	30.77 ¹¹⁵	22.623 ²⁵⁴	24.58 ²⁹
27.3	48.477 ²⁸⁶	50.50 ⁷	32.615 ³⁵⁴	29.62 ⁶⁰	22.877 ²⁷⁶	24.29 ¹²
Oct. 7.3	48.763 ³⁰⁵	50.43 ⁴²	32.969 ³⁷⁸	29.02 ¹	23.153 ²⁹³	24.41 ⁵⁵
17.3	49.068 ³¹⁶	50.85 ⁹²	33.347 ³⁹¹	29.03 ⁶³	23.446 ³⁰⁷	24.96 ⁹⁹
27.2	49.384 ³²³	51.77 ¹⁴⁰	33.738 ³⁹⁷	29.66 ¹²⁶	23.753 ³¹⁴	25.95 ¹³⁹
Nov. 6.2	49.707 ³²²	53.17 ¹⁸⁵	34.135 ³⁹¹	30.92 ¹⁸⁵	24.067 ³¹⁴	27.34 ¹⁷⁷
16.2	50.029 ³¹¹	55.02 ²²³	34.526 ³⁷³	32.77 ²³⁸	24.381 ³⁰⁸	29.11 ²⁰⁹
26.2	50.340 ²⁹⁴	57.25 ²⁵⁵	34.899 ³⁴⁴	35.15 ²⁸⁵	24.689 ²⁹²	31.20 ²³⁴
Dec. 6.1	50.634 ²⁶⁶	59.80 ²⁷⁸	35.243 ³⁰⁴	38.00 ³²²	24.981 ²⁶⁷	33.54 ²⁵²
16.1	50.900 ²³⁰	62.58 ²⁹³	35.547 ²⁵⁴	41.22 ³⁴⁸	25.248 ²³⁵	36.06 ²⁶¹
26.1	51.130 ¹⁸⁶	65.51 ²⁹⁷	35.801 ¹⁹⁶	44.70 ³⁶⁵	25.483 ¹⁹⁴	38.67 ²⁶²
36.1	51.316	68.48	35.997	48.35	25.677	41.29
Mean Place	46.470	56.78	31.669	39.05	20.634	28.08
Sec δ , Tan δ	1.096	-0.448	1.470	-1.078	1.038	-0.279
a, a'	+2.6	-10.4	+1.9	-10.6	+2.8	-10.8
b, b'	+0.02	-0.9	+0.04	-0.8	+0.01	-0.8
Authority and Catalogue No.	B.J.	495	B.J.	498	B.J.	500

APPARENT PLACES OF STARS, 1935

413

AT UPPER TRANSIT AT GREENWICH

Name	β Cancrī		δ^1 Cancrī		ϵ Argus	
	3.76	K2	5.88	Fo	1.74	Ko-B
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	$8^h 12^m$	$+9^{\circ} 22'$	$8^h 19^m$	$+18^{\circ} 32'$	$8^h 21^m$	$-59^{\circ} 17'$
Jan. 1.1	61.691 ¹⁸⁹	71.78 ¹²⁵	40.981 ²⁰⁴	28.36 ⁷³	13.307 ¹⁸⁸	51.85 ³⁸⁴
11.0	61.880 ¹⁴⁰	70.53 ¹⁰⁶	41.185 ¹⁵⁶	27.63 ⁵⁰	13.495 ¹⁰³	55.69 ³⁸⁹
21.0	62.020 ⁸⁹	69.47 ⁸⁷	41.341 ¹⁰⁰	27.13 ³²	13.598 ¹⁵	59.58 ³⁸²
30.9	62.109 ²⁴	68.60 ⁶⁷	41.441 ⁴⁸	26.81 ¹¹	13.613 ⁶⁹	63.40 ³⁶⁵
Feb. 9.9	62.147 ¹²	67.93 ⁴⁸	41.489 ³	26.70 ³	13.544 ¹⁴⁸	67.05 ³⁴¹
19.9	62.135	67.45	41.486	26.73	13.396	70.46
Mar. 1.9	62.078 ⁵⁷	67.15 ³⁰	41.434 ⁵²	26.91 ¹⁸	13.176 ²²⁰	73.56 ³¹⁰
11.9	61.984 ⁹⁴	67.00 ¹⁵	41.342 ⁹²	27.18 ²⁷	12.896 ²⁸⁰	76.26 ²⁷⁰
21.9	61.860 ¹²⁴	66.98 ²	41.219 ¹²³	27.52 ³⁴	12.568 ³²⁸	78.53 ²²⁷
31.8	61.716 ¹⁴⁴	67.06 ⁸	41.075 ¹⁴⁴	27.89 ³⁷	12.203 ³⁶⁵	80.32 ¹⁷⁹
	153	17	158	35	386	129
Apr. 10.8	61.563	67.23	40.917	28.24	11.817	81.61
20.8	61.408 ¹⁵⁵	67.47 ²⁴	40.758 ¹⁵⁹	28.58 ³⁴	11.422 ³⁹⁵	82.38 ⁷⁷
30.7	61.262 ¹⁴⁶	67.76 ²⁹	40.605 ¹⁵³	28.86 ²⁸	11.029 ³⁹³	82.63 ²⁵
May 10.7	61.132 ¹³⁰	68.10 ³⁴	40.469 ¹³⁶	29.11 ²⁵	10.652 ³⁷⁷	82.36 ²⁷
20.7	61.023 ¹⁰⁹	68.47 ³⁷	40.352 ¹¹⁷	29.30 ¹⁹	10.299 ³⁵³	81.58 ⁷⁸
	83	40	88	13	319	127
June 30.7	60.940	68.87	40.264	29.43	09.980	80.31
9.6	60.886 ⁵⁴	69.30 ⁴³	40.204 ⁶⁰	29.51 ⁸	09.703 ²⁷⁷	78.59 ¹⁷²
19.6	60.864 ²²	69.74 ⁴⁴	40.177 ²⁷	29.53 ²	09.476 ²²⁷	76.47 ²¹²
29.6	60.872 ⁸	70.19 ⁴⁵	40.182 ⁵	29.52 ¹	09.303 ¹⁷³	74.01 ²⁴⁶
July 9.6	60.914 ⁴²	70.62 ⁴³	40.223 ⁴¹	29.43 ⁹	09.190 ¹¹³	71.27 ²⁷⁴
	73	39	72	14	42	293
19.5	60.987	71.01	40.295	29.29	09.141	68.34
29.5	61.091 ¹⁰⁴	71.35 ³⁴	40.398 ¹⁰³	29.08 ²¹	09.158 ¹⁷	65.31 ³⁰³
Aug. 8.5	61.223 ¹³²	71.61 ²⁶	40.531 ¹³³	28.78 ³⁰	09.242 ⁸⁴	62.28 ³⁰³
18.4	61.383 ¹⁶⁰	71.75 ¹⁴	40.695 ¹⁶⁴	28.39 ³⁹	09.394 ¹⁵²	59.34 ²⁹⁴
28.4	61.570 ¹⁸⁷	71.76 ¹	40.884 ¹⁸⁹	27.88 ⁵¹	09.612 ²¹⁸	56.60 ²⁷⁴
	211	16	215	65	281	242
Sept. 7.4	61.781	71.60	41.099	27.23	09.893	54.18
17.4	62.016 ²³⁵	71.24 ³⁶	41.340 ²⁴¹	26.47 ⁷⁶	10.234 ³⁴¹	52.16 ²⁰²
27.3	62.274 ²⁵⁸	70.68 ⁵⁶	41.604 ²⁶⁴	25.58 ⁸⁹	10.627 ³⁹³	50.63 ¹⁵³
Oct. 7.3	62.551 ²⁷⁷	69.90 ⁷⁸	41.889 ²⁸⁵	24.53 ¹⁰⁵	11.064 ⁴³⁷	49.67 ⁹⁶
17.3	62.845 ²⁹⁴	68.92 ⁹⁸	42.194 ³⁰⁵	23.37 ¹¹⁶	11.535 ⁴⁷¹	49.33 ³⁴
	308	119	319	126	493	32
27.3	63.153	67.73	42.513	22.11	12.028	49.65
Nov. 6.2	63.471 ³¹⁸	66.38 ¹³⁵	42.841 ³²⁸	20.77 ¹³⁴	12.528 ⁵⁰⁰	50.63 ⁹⁸
16.2	63.791 ³²⁰	64.90 ¹⁴⁸	43.175 ³³⁴	19.42 ¹³⁵	13.022 ⁴⁹⁴	52.25 ¹⁶²
26.2	64.106 ³¹⁵	63.35 ¹⁵⁵	43.506 ³³¹	18.06 ¹³⁶	13.493 ⁴⁷¹	54.46 ²²¹
Dec. 6.1	64.408 ³⁰²	61.76 ¹⁵⁹	43.825 ³¹⁹	16.78 ¹²⁸	13.925 ⁴³²	57.21 ²⁷⁵
	282	155	298	118	380	319
16.1	64.690	60.21	44.123	15.60	14.305	60.40
26.1	64.941 ²⁵¹	58.74 ¹⁴⁷	44.392 ²⁶⁹	14.57 ¹⁰³	14.620 ³¹⁵	63.92 ³⁵²
36.1	65.153 ²¹²	57.40 ¹³⁴	44.621 ²²⁹	13.73 ⁸⁴	14.859 ²³⁹	67.67 ³⁷⁵
Mean Place	59.448	74.03	38.620	32.25	10.839	59.15
Sec δ , Tan δ	1.014	+0.165	1.055	+0.335	1.959	-1.684
a, a'	+3.3	-11.0	+3.4	-11.5	+1.2	-11.6
b, b'	-0.01	-0.8	-0.01	-0.8	+0.07	-0.8
Authority and Catalogue No.	B.J.	503	A.E.	507	B.J.	508

APPARENT PLACES OF STARS, 1935 AT UPPER TRANSIT AT GREENWICH

Name	30 Monocerotis		o Ursæ Majoris		γ Cancri	
	3·95	Ao	3·47	Go	5·52	Ko
Mag. Spect.						
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 8 ^m 22	— 3 41	^h 8 ^m 24	+60 55	^h 8 ^m 28	+20 39
Jan. 1·1	26·833 ¹⁸⁷	36·29 ²⁰¹	57·06 ³⁵	65·78 ¹⁶⁴	59·472 ²¹⁶	43·16 ⁶⁴
11·0	27·020 ¹⁴⁰	38·30 ¹⁸⁶	57·41 ²⁶	67·42 ¹⁹³	59·688 ¹⁶⁷	42·52 ⁴¹
21·0	27·160 ⁸⁹	40·16 ¹⁶⁸	57·67 ¹⁶	69·35 ²¹²	59·855 ¹¹³	42·11 ²⁰
30·9	27·249 ³²	41·84 ¹⁴⁷	57·83 ⁶	71·47 ²²³	59·968 ⁵⁹	41·91 [—]
Feb. 9·9	27·288 ⁹	43·31 ¹²⁴	57·89 ⁴	73·70 ²²³	60·027 ⁵	41·91 ¹⁶
19·9	27·279 ⁵⁴	44·55 ⁹⁹	57·85 ¹³	75·93 ²¹³	60·032 ⁴³	42·07 ³¹
Mar. 1·9	27·225 ⁹¹	45·54 ⁷⁷	57·72 ²⁰	78·06 ¹⁹⁵	59·989 ⁸⁶	42·38 ³⁸
11·9	27·134 ¹²¹	46·31 ⁵³	57·52 ²⁷	80·01 ¹⁶⁸	59·903 ¹¹⁹	42·76 ⁴⁵
21·9	27·013 ¹⁴⁰	46·84 ³¹	57·25 ³²	81·69 ¹³³	59·784 ¹⁴²	43·21 ⁴⁵
31·8	26·873 ¹⁵²	47·15 ¹¹	56·93 ³⁵	83·02 ⁹⁵	59·642 ¹⁵⁷	43·66 ⁴³
Apr. 10·8	26·721 ¹⁵⁴	47·26 ⁸	56·58 ³⁶	83·97 ⁵¹	59·485 ¹⁶⁰	44·09 ³⁹
20·8	26·567 ¹⁴⁸	47·18 ²⁷	56·22 ³⁵	84·48 ⁷	59·325 ¹⁵⁵	44·48 ³²
30·7	26·419 ¹³⁴	46·91 ⁴⁴	55·87 ³³	84·55 ³⁶	59·170 ¹⁴⁰	44·80 ²⁵
May 10·7	26·285 ¹¹⁵	46·47 ⁵⁹	55·54 ²⁹	84·19 ⁷⁹	59·030 ¹²¹	45·05 ¹⁸
20·7	26·170 ⁹²	45·88 ⁷⁴	55·25 ²⁵	83·40 ¹¹⁷	58·909 ⁹⁵	45·23 ⁹
30·7	26·078 ⁶⁴	45·14 ⁸⁶	55·00 ¹⁹	82·23 ¹⁵³	58·814 ⁶⁵	45·32 ²
June 9·6	26·014 ³⁵	44·28 ⁹⁶	54·81 ¹²	80·70 ¹⁸³	58·749 ³⁵	45·31 ⁶
19·6	25·979 ⁶	43·32 ¹⁰⁴	54·69 ⁶	78·87 ²⁰⁹	58·714 ²	45·28 ¹³
29·6	25·973 ²⁵	42·28 ¹⁰⁸	54·63 [—]	76·78 ²²⁹	58·712 ³¹	45·15 ²⁰
July 9·6	25·998 ⁵⁶	41·20 ¹⁰⁹	54·63 ⁸	74·49 ²⁴⁴	58·743 ⁶¹	44·95 ²⁸
19·5	26·054 ⁸⁶	40·11 ¹⁰⁶	54·71 ¹⁴	72·05 ²⁵⁴	58·807 ⁹⁵	44·67 ³⁷
29·5	26·140 ¹¹⁵	39·05 ⁹⁸	54·85 ²⁰	69·51 ²⁵⁹	58·902 ¹²⁶	44·39 ⁴⁵
Aug. 8·5	26·255 ¹⁴³	38·07 ⁸⁵	55·05 ²⁷	66·92 ²⁵⁹	59·028 ¹⁵⁵	43·85 ⁵⁵
18·4	26·398 ¹⁷⁰	37·22 ⁶⁷	55·32 ³²	64·33 ²⁵⁴	59·183 ¹⁸¹	43·30 ⁶⁶
28·4	26·568 ¹⁹⁶	36·55 ⁴⁵	55·64 ³⁸	61·79 ²⁴⁵	59·367 ²¹⁰	42·64 ⁷⁸
Sept. 7·4	26·764 ²²²	36·10 ¹⁸	56·02 ⁴²	59·34 ²³²	59·577 ²³⁷	41·86 ⁹⁰
17·4	26·986 ²⁴⁵	35·92 ¹¹	56·44 ⁴⁸	57·02 ²¹³	59·814 ²⁶¹	40·96 ¹⁰³
27·3	27·231 ²⁶⁶	36·03 ⁴³	56·92 ⁵¹	54·89 ¹⁹¹	60·075 ²⁸³	39·93 ¹¹⁵
Oct. 7·3	27·497 ²⁸⁵	36·46 ⁷⁷	57·43 ⁵⁴	52·98 ¹⁶⁵	60·358 ³⁰⁴	38·78 ¹²⁵
17·3	27·782 ³⁰¹	37·23 ¹⁰⁹	57·97 ⁵⁷	51·33 ¹³³	60·662 ³²¹	37·53 ¹³³
27·3	28·083 ³¹⁰	38·32 ¹³⁹	58·54 ⁵⁹	50·00 ⁹⁹	60·983 ³³⁴	36·20 ¹³⁹
Nov. 6·2	28·393 ³¹⁴	39·71 ¹⁶⁶	59·13 ⁵⁹	49·01 ⁶¹	61·317 ³³⁹	34·81 ¹³⁹
16·2	28·707 ³¹⁰	41·37 ¹⁸⁷	59·72 ⁵⁸	48·40 ²⁰	61·656 ³³⁷	33·42 ¹³⁶
26·2	29·017 ²⁹⁸	43·24 ²⁰³	60·30 ⁵⁶	48·20 ²³	61·993 ³²⁷	32·06 ¹²⁷
Dec. 6·1	29·315 ²⁷⁸	45·27 ²¹⁰	60·86 ⁵²	48·43 ⁶⁵	62·320 ³⁰⁸	30·79 ¹¹⁴
16·1	29·593 ²⁴⁸	47·37 ²¹³	61·38 ⁴⁶	49·08 ¹⁰⁷	62·628 ²⁷⁸	29·65 ⁹⁷
26·1	29·841 ²¹⁰	49·50 ²⁰⁷	61·84 ³⁹	50·15 ¹⁴⁴	62·906 ²⁴⁰	28·68 ⁹⁷
36·1	30·051	51·57	62·23	51·59	63·146	27·91 ⁷⁷
Mean Place	24·741	35·67	52·788	74·54	57·101	47·91
Secδ, Tanδ	1·002	— 0·065	2·059	+ 1·799	1·069	+ 0·377
a, a'	+3·0	—11·7	+5·0	—11·8	+3·5	—12·1
b, b'	0·00	— 0·8	—0·07	— 0·8	—0·02	— 0·8
Authority and Catalogue No.	B.J.	509	B.J.	512	B.J.	517

APPARENT PLACES OF STARS, 1935

415

AT UPPER TRANSIT AT GREENWICH

Name	γ Cancri		α Pyxidis		δ Argus <i>m.</i>	
Mag. Spect.	4.73	Ao	3.70	Bz	2.01	Ao
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	$\begin{smallmatrix}^h &^m \\ 8 & 39\end{smallmatrix}$	$\begin{smallmatrix}^{\circ} &' &'' \\ +21 & 41\end{smallmatrix}$	$\begin{smallmatrix}^h &^m \\ 8 & 40\end{smallmatrix}$	$\begin{smallmatrix}^{\circ} &' &'' \\ -32 & 56\end{smallmatrix}$	$\begin{smallmatrix}^h &^m \\ 8 & 42\end{smallmatrix}$	$\begin{smallmatrix}^{\circ} &' &'' \\ -54 & 28\end{smallmatrix}$
Jan. 1.1	33.960 ²²⁵	67.22 ⁶¹	60.668 ¹⁹⁸	59.45 ³²⁹	56.685 ²²⁰	02.99 ³⁷⁶
11.1	34.185 ¹⁷⁸	66.61 ³⁸	60.866 ¹⁴⁵	62.74 ³²⁸	56.905 ¹⁴⁶	06.75 ³⁸³
21.0	34.363 ¹²⁴	66.23 ¹⁶	61.011 ⁸⁸	66.02 ³¹⁸	57.051 ⁶⁹	10.58 ³⁸¹
31.0	34.487 ⁷⁰	66.07 ³	61.099 ³¹	69.20 ³⁰⁰	57.120 ⁷	14.39 ³⁶⁷
Feb. 9.9	34.557 ¹⁷	66.10 ²³	61.130 ²³	72.20 ²⁷⁵	57.113 ⁸⁰	18.06 ³⁴⁶
19.9	34.574 ³⁴	66.33 ³⁶	61.107 ⁷³	74.95 ²⁴⁶	57.033 ¹⁴⁷	21.52 ³¹⁶
Mar. 1.9	34.540 ⁷⁷	66.69 ⁴⁶	61.034 ¹¹⁶	77.41 ²¹¹	56.886 ²⁰⁵	24.68 ²⁸²
11.9	34.463 ¹¹²	67.15 ⁵¹	60.918 ¹⁵⁰	79.52 ¹⁷⁴	56.681 ²⁵¹	27.50 ²⁴⁰
21.9	34.351 ¹³⁹	67.66 ⁵²	60.768 ¹⁷⁶	81.26 ¹³⁵	56.430 ²⁸⁶	29.90 ¹⁹⁵
31.8	34.212 ¹⁵²	68.18 ⁴⁹	60.592 ¹⁹²	82.61 ⁹⁴	56.144 ³¹¹	31.85 ¹⁴⁸
Apr. 10.8	34.060 ¹⁵⁸	68.67 ⁴⁵	60.400 ¹⁹⁹	83.55 ⁵³	55.833 ³²⁴	33.33 ⁹⁸
20.8	33.902 ¹⁵⁷	69.12 ⁴⁰	60.201 ¹⁹⁷	84.08 ¹¹	55.509 ³²⁵	34.31 ⁴⁷
30.8	33.745 ¹⁴³	69.52 ²⁷	60.004 ¹⁸⁷	84.19 ²⁸	55.184 ³¹⁷	34.78 ⁴
May 10.7	33.602 ¹²⁵	69.79 ²⁰	59.817 ¹⁷¹	83.91 ⁶⁹	54.867 ³⁰⁰	34.74 ⁵⁴
20.7	33.477 ¹⁰¹	69.99 ⁹	59.646 ¹⁵⁰	83.22 ¹⁰⁵	54.567 ²⁷⁴	34.20 ¹⁰²
30.7	33.376 ⁷⁵	70.08 ¹	59.496 ¹²⁴	82.17 ¹³⁹	54.293 ²⁴¹	33.18 ¹⁴⁸
June 9.6	33.301 ⁴³	70.07 ⁷	59.372 ⁹⁵	80.78 ¹⁷⁰	54.052 ²⁰²	31.70 ¹⁸⁹
19.6	33.258 ¹⁰	70.00 ¹⁸	59.277 ⁶³	79.08 ¹⁹⁵	53.850 ¹⁵⁹	29.81 ²²⁵
29.6	33.248 ¹⁹	69.82 ²⁷	59.214 ²⁹	77.13 ²¹⁵	53.691 ¹⁰⁹	27.56 ²⁵⁴
July 9.6	33.267 ⁵³	69.55 ³⁵	59.185 ⁷	74.98 ²²⁸	53.582 ⁵⁷	25.02 ²⁷⁶
19.5	33.320 ⁸⁶	69.20 ⁴⁴	59.192 ⁴³	72.70 ²³⁵	53.525 ¹	22.26 ²⁸⁹
29.5	33.406 ¹¹⁴	68.76 ⁵²	59.235 ⁷⁹	70.35 ²³³	53.524 ⁵⁵	19.37 ²⁹²
Aug. 8.5	33.520 ¹⁴⁷	68.24 ⁶⁵	59.314 ¹¹⁶	68.02 ²²²	53.579 ¹¹⁴	16.45 ²⁸⁷
18.5	33.667 ¹⁷³	67.59 ⁷⁶	59.430 ¹⁵²	65.80 ²⁰³	53.693 ¹⁷¹	13.58 ²⁷¹
28.4	33.840 ²⁰³	66.83 ⁸⁸	59.582 ¹⁸⁹	63.77 ¹⁷⁷	53.864 ²²⁹	10.87 ²⁴³
Sept. 7.4	34.043 ²³⁰	65.95 ¹⁰⁰	59.771 ²²⁴	62.00 ¹⁴¹	54.093 ²⁸³	08.44 ²⁰⁷
17.4	34.273 ²⁵⁴	64.95 ¹¹⁴	59.995 ²⁵⁶	60.59 ⁹⁸	54.376 ³³³	06.37 ¹⁶¹
27.3	34.527 ²⁸¹	63.81 ¹²⁴	60.251 ²⁸⁵	59.61 ⁵⁰	54.709 ³⁷⁷	04.76 ¹⁰⁸
Oct. 7.3	34.808 ³⁰¹	62.57 ¹³⁵	60.536 ³¹²	59.11 ³	55.086 ⁴¹³	03.68 ⁴⁸
17.3	35.109 ³²⁰	61.22 ¹⁴⁰	60.848 ³³¹	59.14 ⁵⁷	55.499 ⁴³⁹	03.20 ¹⁵
27.3	35.429 ³³⁴	59.82 ¹⁴⁴	61.179 ³⁴⁴	59.71 ¹¹²	55.938 ⁴⁵⁴	03.35 ⁸⁰
Nov. 6.2	35.763 ³⁴²	58.38 ¹⁴⁷	61.523 ³⁴⁹	60.83 ¹⁶⁵	56.392 ⁴⁵⁶	04.15 ¹⁴⁴
16.2	36.105 ³⁴⁰	56.91 ¹⁴⁰	61.872 ³⁴⁵	62.48 ²¹²	56.848 ⁴⁴⁵	05.59 ²⁰⁴
26.2	36.445 ³³⁴	55.51 ¹³¹	62.217 ³²⁹	64.60 ²⁵⁴	57.293 ⁴¹⁸	07.63 ²⁵⁷
Dec. 6.2	36.779 ³¹⁶	54.20 ¹¹⁴	62.546 ³⁰⁵	67.14 ²⁸⁷	57.711 ³⁷⁸	10.20 ³⁰⁴
16.1	37.095 ²⁸⁷	53.06 ⁹⁸	62.851 ²⁷⁰	70.01 ³¹⁰	58.089 ³²⁶	13.24 ³³⁹
26.1	37.382 ²⁵⁰	52.08 ⁷⁴	63.121 ²²⁷	73.11 ³²⁶	58.415 ²⁶³	16.63 ³⁶⁵
36.1	37.632	51.34	63.348	76.37	58.678	20.28
Mean Place	31.602	72.78	58.695	63.64	54.474	10.45
Sec δ , Tan δ	1.076	+ 0.398	1.192	- 0.648	1.721	- 1.400
<i>a</i> , <i>a'</i>	+3.5	-12.9	+2.4	-12.9	+1.7	-13.1
<i>b</i> , <i>b'</i>	-0.02	- 0.8	+0.03	- 0.8	+0.06	- 0.8
Authority and Catalogue No.	A.E.	527	B.J.	529	B.J.	531

† First transit, Jan. 31

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ε Hydræ m.		ζ Hydræ		ι Ursæ Majoris	
	3.53	F8	3.30	Ko	3.12	A5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 8 ^m 43	+ ^s 6 39	^h 8 ^m 51	+ ^s 6 11	^h 8 ^m 54	+ ^s 48 17
Jan. 1-1	22.205 ²¹³	27.30 ¹⁵⁰	59.600 ²²⁰	35.24 ¹⁵⁶	49.106 ³¹⁰	43.32 ⁷⁸
11-1	22.418 ¹⁶⁷	25.80 ¹³²	59.820 ¹⁷⁵	33.68 ¹³⁷	49.416 ²⁴⁷	44.10 ¹¹¹
21-0	22.585 ¹¹⁷	24.48 ¹¹²	59.995 ¹²⁶	32.31 ¹¹⁶	49.663 ¹⁷⁷	45.21 ¹³⁹
31-0	22.702 ⁶⁶	23.36 ⁹⁰	60.121 ⁷⁴	31.15 ⁹⁴	49.840 ¹⁰²	46.60 ¹⁵⁸
Feb. 9-9	22.768 ¹⁶	22.46 ⁶⁸	60.195 ²⁴	30.21 ⁷²	49.942 ²⁹	48.18 ¹⁷¹
19-9	22.784 ³⁰	21.78 ⁴⁷	60.219 ²³	29.49 ⁵¹	49.971 ⁴²	49.89 ¹⁷⁴
Mar. 1-9	22.754 ⁷¹	21.31 ²⁹	60.196 ⁶³	28.98 ³¹	49.929 ¹⁰⁴	51.63 ¹⁷⁰
11-9	22.683 ¹⁰³	21.02 ¹³	60.133 ⁹⁷	28.67 ¹⁴	49.825 ¹⁵⁶	53.33 ¹⁵⁷
21-9	22.580 ¹²⁶	20.89 ²	60.036 ¹²²	28.53 ¹³⁸	49.669 ¹⁹⁷	54.90 ¹³⁷
31-8	22.454 ¹⁴²	20.91 ¹⁴	59.914 ¹³⁸	28.53 ¹³	49.472 ²²⁴	56.27 ¹¹¹
Apr. 10-8	22.312 ¹⁴⁷	21.05 ²³	59.776 ¹⁴⁴	28.66 ²⁴	49.248 ²³⁸	57.38 ⁸¹
20-8	22.165 ¹⁴⁴	21.28 ³¹	59.632 ¹⁴²	28.90 ³¹	49.010 ²³⁹	58.19 ⁴⁷
30-8	22.021 ¹³⁴	21.59 ³⁸	59.490 ¹³⁴	29.21 ³⁸	48.771 ²²⁹	58.66 ¹³
May 10-7	21.887 ¹¹⁷	21.97 ⁴³	59.356 ¹¹⁸	29.59 ⁴⁴	48.542 ²⁰⁷	58.79 ²¹
20-7	21.770 ⁹⁵	22.40 ⁴⁷	59.238 ⁹⁸	30.03 ⁴⁹	48.335 ¹⁷⁹	58.58 ⁵⁵
30-7	21.675 ⁷¹	22.87 ⁵¹	59.140 ⁷⁵	30.52 ⁵²	48.156 ¹⁴³	58.03 ⁸⁶
June 9-7	21.604 ⁴⁴	23.38 ⁵³	59.065 ⁴⁹	31.04 ⁵³	48.013 ¹⁰³	57.17 ¹¹⁵
19-6	21.560 ¹⁵	23.91 ⁵³	59.016 ²¹	31.57 ⁵⁵	47.910 ⁶⁰	56.02 ¹³⁹
29-6	21.545 ¹⁴	24.44 ⁵²	58.995 ⁸	32.12 ⁵³	47.850 ¹⁵	54.63 ¹⁶²
July 9-6	21.559 ⁴⁴	24.96 ⁴⁸	59.003 ³⁶	32.65 ⁵⁰	47.835 ³¹	53.01 ¹⁸¹
19-5	21.603 ⁷³	25.44 ⁴²	59.039 ⁶⁴	33.15 ⁴⁴	47.866 ⁷⁶	51.20 ¹⁹⁷
29-5	21.676 ¹⁰²	25.86 ³⁴	59.103 ⁹³	33.59 ³⁵	47.942 ¹²¹	49.23 ²⁰⁸
Aug. 8-5	21.778 ¹²⁹	26.20 ²²	59.196 ¹²¹	33.94 ²²	48.063 ¹⁶⁴	47.15 ²¹⁶
18-5	21.907 ¹⁵⁷	26.42 ⁶	59.317 ¹⁴⁸	34.16 ⁸	48.227 ²⁰⁶	44.99 ²²¹
28-4	22.064 ¹⁸⁴	26.48 ¹¹	59.465 ¹⁷⁶	34.24 ¹⁰	48.433 ²⁴⁷	42.78 ²²²
Sept. 7-4	22.248 ²¹⁰	26.37 ³²	59.641 ²⁰³	34.14 ³²	48.680 ²⁸⁷	40.56 ²²⁰
17-4	22.458 ²³⁵	26.05 ⁵⁴	59.844 ²²⁹	33.82 ⁵⁴	48.967 ³²³	38.36 ²¹⁵
27-4	22.693 ²⁵⁹	25.51 ⁷⁸	60.073 ²⁵³	33.28 ⁷⁹	49.290 ³⁵⁸	36.21 ²⁰⁵
Oct. 7-3	22.952 ²⁸¹	24.73 ¹⁰²	60.326 ²⁷⁷	32.49 ¹⁰³	49.648 ³⁹⁰	34.16 ¹⁹²
17-3	23.233 ²⁹⁹	23.71 ¹²⁵	60.603 ²⁹⁶	31.46 ¹²⁶	50.038 ⁴¹⁶	32.24 ¹⁷³
27-3	23.532 ³¹³	22.46 ¹⁴⁵	60.899 ³¹²	30.20 ¹⁴⁷	50.454 ⁴³⁷	30.51 ¹⁵¹
Nov. 6-2	23.845 ³²¹	21.01 ¹⁶¹	61.211 ³²¹	28.73 ¹⁶⁴	50.891 ⁴⁴⁹	29.00 ¹²⁴
16-2	24.166 ³²⁰	19.40 ¹⁷³	61.532 ³²³	27.09 ¹⁷⁵	51.340 ⁴⁵²	27.76 ⁹²
26-2	24.486 ³¹³	17.67 ¹⁷⁸	61.855 ³¹⁶	25.34 ¹⁸²	51.792 ⁴⁴³	26.84 ⁵⁷
Dec. 6-2	24.799 ²⁹⁶	15.89 ¹⁷⁷	62.171 ³⁰¹	23.52 ¹⁸²	52.235 ⁴²²	26.27 ²⁰
16-1	25.095 ²⁷¹	14.12 ¹⁷¹	62.472 ²⁷⁶	21.70 ¹⁷⁶	52.657 ³⁸⁸	26.07 ¹⁹
26-1	25.366 ²³⁵	12.41 ¹⁶⁰	62.748 ²⁴²	19.94 ¹⁶⁵	53.045 ³⁴¹	26.26 ⁵⁵
36-1	25.601	10.81	62.990	18.29	53.386	26.81
Mean Place	20.082	30.41	57.508	38.62	45.972	53.80
Secδ, Tanδ	1.007	+ 0.117	1.006	+ 0.109	1.503	+ 1.122
a, a'	+3.2	-13.1	+3.2	-13.7	+4.2	-13.8
b, b'	-0.01	- 0.8	0.00	- 0.7	-0.05	- 0.7
Authority and Catalogue No.	A.N.	532	B.J.	539	B.J.	542

APPARENT PLACES OF STARS, 1935

417

AT UPPER TRANSIT AT GREENWICH

Name	α Cancrī		κ Cancrī		λ Argus	
	4.27	A3	5.14	B8	2.22	K5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 8 ^m 54	+12° 06'	^h 9 ^m 04	+10° 55'	^h 9 ^m 05	-43° 10'
Jan. 1.1	58.152	33.26	15.763	46.46	38.116	03.27
11.1	58.381	32.02	15.998	45.12	38.352	06.79
21.0	58.563	30.99	16.187	43.99	38.529	10.38
31.0	58.696	30.19	16.327	43.08	38.644	13.94
Feb. 9.9	58.777	29.61	16.416	42.40	38.695	17.39
19.9	58.807	29.24	16.455	41.96	38.685	20.63
Mar. 1.9	58.788	29.07	16.445	41.72	38.619	23.61
11.9	58.727	29.07	16.393	41.66	38.502	26.26
21.9	58.632	29.19	16.306	41.74	38.343	28.54
31.9	58.511	29.42	16.193	41.93	38.152	30.41
Apr. 10.8	58.373	29.72	16.060	42.22	37.939	31.85
20.8	58.228	30.07	15.918	42.55	37.711	32.84
30.8	58.084	30.44	15.778	42.92	37.480	33.37
May 10.7	57.949	30.82	15.644	43.33	37.252	33.44
20.7	57.829	31.20	15.522	43.75	37.036	33.06
30.7	57.729	31.56	15.420	44.15	36.838	32.24
June 9.7	57.653	31.90	15.336	44.54	36.663	31.00
19.6	57.603	32.22	15.280	44.90	36.516	29.39
29.6	57.581	32.49	15.252	45.21	36.401	27.45
July 9.6	57.588	32.72	15.250	45.50	36.322	25.22
19.6	57.624	32.89	15.278	45.73	36.280	22.79
29.5	57.689	32.98	15.331	45.88	36.279	20.23
Aug. 8.5	57.783	32.97	15.416	45.94	36.321	17.62
18.5	57.905	32.85	15.527	45.84	36.406	15.05
28.4	58.055	32.58	15.668	45.61	36.535	12.62
Sept. 7.4	58.233	32.15	15.837	45.22	36.709	10.42
17.4	58.438	31.54	16.033	44.64	36.928	08.55
27.4	58.669	30.73	16.257	43.85	37.188	07.09
Oct. 7.3	58.926	29.73	16.507	42.86	37.487	06.12
17.3	59.206	28.53	16.783	41.67	37.820	05.69
27.3	59.507	27.16	17.079	40.29	38.181	05.85
Nov. 6.3	59.824	25.65	17.392	38.75	38.561	06.60
16.2	60.151	24.03	17.718	37.11	38.951	07.95
26.2	60.480	22.36	18.048	35.38	39.339	09.86
Dec. 6.2	60.804	20.68	18.372	33.63	39.714	12.27
16.1	61.113	19.07	18.684	31.94	40.065	15.10
26.1	61.397	17.55	18.973	30.34	40.378	18.28
36.1	61.648	16.20	19.227	28.90	40.645	21.70
Mean Place	55.999	37.93	13.657	51.32	36.183	09.55
Secδ, Tanδ	1.023	+0.215	1.019	+0.193	1.371	-0.938
a, a'	+3.3	-13.9	+3.3	-14.4	+2.2	-14.5
b, b'	-0.01	-0.7	-0.01	-0.7	+0.05	-0.7
Authority and Catalogue No.	B.J.	543	A.E.	556	B.T.	560

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ξ Cancri		β Argus		ι Argus	
	5.22	G5	1.80	A0	2.25	F0
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 9 ^m 05	+22° 18'	^h 9 ^m 12	-69° 26'	^h 9 ^m 15	-58° 59'
Jan. 1.1	39.727 ²⁵¹	26.90 ⁷²	32.34 ³⁶	47.08 ³⁶⁹	23.159 ²⁹²	58.01 ³⁶⁸
11.1	39.978 ²⁰⁴	26.18 ⁴⁶	32.70 ²⁴	50.77 ³⁸⁸	23.451 ²¹³	61.69 ³⁸⁴
21.1	40.182 ¹⁵²	25.72 ²⁰	32.94 ¹³	54.65 ³⁹⁶	23.664 ¹³⁰	65.53 ³⁸⁹
31.0	40.334 ⁹⁸	25.52 ⁴	33.07 ¹	58.61 ³⁹⁵	23.794 ⁴⁶	69.42 ³⁸⁵
Feb. 9.9	40.432 ⁴⁴	25.56 ²⁵	33.08 ¹¹	62.56 ³⁸³	23.840 ³⁶	73.27 ³⁷⁰
19.9	40.476 ⁸	25.81 ⁴²	32.97 ²¹	66.39 ³⁶³	23.804 ¹¹³	76.97 ³⁴⁸
Mar. 1.9	40.468 ⁵⁴	26.23 ⁵³	32.76 ³¹	70.02 ³³⁴	23.691 ¹⁸⁰	80.45 ³¹⁸
11.9	40.414 ⁹²	26.76 ⁶¹	32.45 ³⁹	73.36 ³⁰⁰	23.511 ²³⁹	83.63 ²⁸²
21.9	40.322 ¹²²	27.37 ⁶⁴	32.06 ⁴⁶	76.36 ²⁵⁸	23.272 ²⁸⁶	86.45 ²⁴¹
31.9	40.200 ¹⁴²	28.01 ⁶²	31.60 ⁵¹	78.94 ²¹³	22.986 ³²¹	88.86 ¹⁹⁵
Apr. 10.8	40.058 ¹⁵¹	28.63 ⁵⁸	31.09 ⁵⁵	81.07 ¹⁶⁵	22.665 ³⁴⁵	90.81 ¹⁴⁷
20.8	39.907 ¹⁵³	29.21 ⁴⁹	30.54 ⁵⁷	82.72 ¹¹²	22.320 ³⁵⁸	92.28 ⁹⁶
30.8	39.754 ¹⁴⁶	29.70 ⁴⁰	29.97 ⁵⁷	83.84 ⁶⁰	21.962 ³⁵⁸	93.24 ⁴⁵
May 10.8	39.608 ¹³¹	30.10 ²⁹	29.40 ⁵⁶	84.44 ⁵	21.604 ³⁴⁹	93.69 ⁷
20.7	39.477 ¹¹²	30.39 ¹⁷	28.84 ⁵⁴	84.49 ⁴⁸	21.255 ³³¹	93.62 ⁵⁸
30.7	39.365 ⁸⁷	30.56 ⁶	28.30 ⁵⁰	84.01 ⁹⁹	20.924 ³⁰⁵	93.04 ¹⁰⁷
June 9.7	39.278 ⁶¹	30.62 ⁶	27.80 ⁴⁶	83.02 ¹⁴⁸	20.619 ²⁷⁰	91.97 ¹⁵²
19.6	39.217 ³³	30.56 ¹⁷	27.34 ³⁹	81.54 ¹⁹³	20.349 ²²⁹	90.45 ¹⁹⁴
29.6	39.184 ¹	30.39 ²⁸	26.95 ³²	79.61 ²³²	20.120 ¹⁸⁰	88.51 ²³¹
July 9.6	39.183 ²⁸	30.11 ⁴⁰	26.63 ²³	77.29 ²⁶³	19.940 ¹²⁷	86.20 ²⁵⁹
19.6	39.211 ⁵⁸	29.71 ⁵²	26.40 ¹⁵	74.66 ²⁸⁷	19.813 ⁶⁸	83.61 ²⁷⁹
29.5	39.269 ⁸⁹	29.19 ⁶³	26.25 ⁵	71.79 ³⁰²	19.745 ⁵	80.82 ²⁹¹
Aug. 8.5	39.358 ¹¹⁹	28.56 ⁷⁶	26.20 ⁵	68.77 ³⁰⁶	19.740 ⁶⁰	77.91 ²⁹⁵
18.5	39.477 ¹⁴⁸	27.80 ⁸⁸	26.25 ¹⁵	65.71 ³⁰⁰	19.800 ¹²⁷	74.96 ²⁸⁶
28.5	39.625 ¹⁷⁷	26.92 ¹⁰²	26.40 ²⁵	62.71 ²⁸³	19.927 ¹⁹⁶	72.10 ²⁶⁶
Sept. 7.4	39.802 ²⁰⁷	25.90 ¹¹⁵	26.65 ³⁶	59.88 ²⁵⁴	20.123 ²⁶²	69.44 ²³⁶
17.4	40.009 ²³⁵	24.75 ¹²⁷	27.01 ⁴⁵	57.34 ²¹⁶	20.619 ³²⁵	67.08 ¹⁹⁷
27.4	40.244 ²⁶³	23.48 ¹⁴⁰	27.46 ⁵⁴	55.18 ¹⁶⁸	20.710 ³⁸³	65.11 ¹⁴⁹
Oct. 7.3	40.507 ²⁸⁸	22.08 ¹⁵⁰	28.00 ⁶⁰	53.50 ¹¹¹	21.093 ⁴³³	63.62 ⁹²
17.3	40.795 ³¹²	20.58 ¹⁵⁸	28.60 ⁶⁶	52.39 ⁴⁹	21.526 ⁴⁷³	62.70 ³¹
27.3	41.107 ³²⁹	19.00 ¹⁶²	29.26 ⁷⁰	51.90 ¹⁷	21.999 ⁴⁹⁹	62.39 ³⁹
Nov. 6.3	41.436 ³⁴²	17.38 ¹⁶¹	29.96 ⁷⁰	52.07 ⁸⁴	22.498 ⁵¹²	62.73 ⁹⁴
16.2	41.778 ³⁴⁶	15.77 ¹⁵⁶	30.66 ⁶⁹	52.91 ¹⁵⁰	23.010 ⁵⁰⁸	63.72 ¹⁶³
26.2	42.124 ³⁴⁴	14.21 ¹⁴⁶	31.35 ⁶⁶	54.41 ²¹¹	23.518 ⁴⁸⁸	65.35 ²²²
Dec. 6.2	42.468 ³³⁰	12.75 ¹³⁰	32.01 ⁶⁰	56.52 ²⁶⁶	24.006 ⁴⁵²	67.57 ²⁷⁴
16.2	42.798 ³⁰⁷	11.45 ¹¹⁰	32.61 ⁵²	59.18 ³¹³	24.458 ⁴⁰¹	70.31 ³¹⁸
26.1	43.105 ²⁷²	10.35 ⁸⁷	33.13 ⁴²	62.31 ³⁵⁰	24.859 ³³⁷	73.49 ³⁵²
36.1	43.377	09.48	33.55	65.81	25.196	77.01
Mean Place	37.456	34.10	29.714	57.24	21.028	67.00
Sec δ , Tan δ	1.081	+0.410	2.849	-2.667	1.942	-1.664
a, a'	+3.5	-14.5	+0.7	-14.9	+1.6	-15.1
b, b'	-0.02	-0.7	+0.13	-0.7	+0.08	-0.7
Authority and Catalogue No.	N.A.	559	B.J.	566	A.N.	570

† Second transit, Feb. 9

APPARENT PLACES OF STARS, 1935

419

AT UPPER TRANSIT AT GREENWICH

Name	83 Cancrī		40 Lyncis		θ Pyxidīs	
Mag. Spect.	6.60	F5	3.30	K5	4.93	Ma
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 9 ^m 15	+17° 58'	^h 9 ^m 17	+34° 39'	^h 9 ^m 18	-25° 41'
Jan. 1.1	23.484 ²⁵²	48.03 ¹⁰¹	08.525 ²⁸⁶	56.57 ¹⁰	38.625 ²³⁵	13.69 ³⁰¹
11.1	23.736 ²⁰⁸	47.02 ⁷⁵	08.811 ²³⁶	56.47 ²²	38.860 ¹⁸⁸	16.70 ³⁰²
21.1	23.944 ¹⁵⁷	46.27 ⁵⁰	09.047 ¹⁷⁹	56.69 ⁵²	39.048 ¹³⁶	19.72 ²⁹³
31.0	24.101 ¹⁰⁵	45.77 ²⁶	09.226 ¹¹⁹	57.21 ⁷⁷	39.184 ⁸⁴	22.65 ²⁷⁸
Feb. 10.0	24.206 ⁵¹	45.51 ³	09.345 ⁵⁸	57.98 ⁹⁸	39.268 ³⁰	25.43 ²⁵⁵
19.9	24.257 ²	45.48 ¹⁷	09.403 ¹	58.96 ¹¹²	39.298 ²⁰	27.98 ²³⁰
Mar. 1.9	24.259 ⁴⁴	45.65 ³¹	09.402 ⁵³	60.08 ¹¹⁹	39.278 ⁶¹	30.28 ²⁰¹
11.9	24.215 ⁸²	45.96 ⁴³	09.349 ⁹⁷	61.27 ¹¹⁹	39.217 ¹⁰⁰	32.29 ¹⁶⁹
21.9	24.133 ¹¹¹	46.39 ⁵⁰	09.252 ¹³⁴	62.46 ¹¹²	39.117 ¹²⁸	33.98 ¹³³
31.9	24.022 ¹³¹	46.89 ⁵²	09.118 ¹⁵⁸	63.58 ¹⁰²	38.989 ¹⁴⁹	35.31 ⁹⁸
Apr. 10.8	23.891 ¹⁴³	47.41 ⁵²	08.960 ¹⁷³	64.60 ⁸⁴	38.840 ¹⁶⁰	36.29 ⁶⁴
20.8	23.748 ¹⁴⁵	47.93 ⁴⁹	08.787 ¹⁷⁶	65.44 ⁶⁶	38.680 ¹⁶⁵	36.93 ²⁷
30.8	23.603 ¹⁴⁰	48.42 ⁴³	08.611 ¹⁷²	66.10 ⁴³	38.515 ¹⁶¹	37.20 ⁶
May 10.8	23.463 ¹²⁸	48.85 ³⁷	08.439 ¹⁵⁸	66.53 ²⁰	38.354 ¹⁵³	37.14 ⁴⁰
20.7	23.335 ¹⁰⁹	49.22 ²⁹	08.281 ¹³⁹	66.73 ⁴	38.201 ¹³⁷	36.74 ⁷³
30.7	23.226 ⁸⁹	49.51 ²⁰	08.142 ¹¹³	66.69 ²⁶	38.064 ¹¹⁸	36.01 ¹⁰³
June 9.7	23.137 ⁶⁴	49.71 ¹²	08.029 ⁸⁵	66.43 ⁴⁸	37.946 ⁹⁵	34.98 ¹³¹
19.6	23.073 ³⁹	49.83 ⁴	07.944 ⁵⁵	65.95 ⁷⁰	37.851 ⁷²	33.67 ¹⁵³
29.6	23.034 ⁹	49.87 ⁷	07.889 ²⁰	65.25 ⁸⁸	37.779 ⁴³	32.14 ¹⁷³
July 9.6	23.025 ¹⁸	49.80 ¹⁶	07.869 ¹³	64.37 ¹⁰⁶	37.736 ¹⁵	30.41 ¹⁸⁵
19.6	23.043 ⁴⁸	49.64 ²⁸	07.882 ⁴⁷	63.31 ¹²²	37.721 ¹⁵	28.56 ¹⁹⁴
29.5	23.091 ⁷⁶	49.36 ⁴⁰	07.929 ⁸²	62.09 ¹³⁷	37.736 ⁴⁷	26.62 ¹⁹⁴
Aug. 8.5	23.167 ¹⁰⁵	48.96 ⁵²	08.011 ¹¹⁵	60.72 ¹⁵⁰	37.783 ⁸⁰	24.68 ¹⁸⁹
18.5	23.272 ¹³³	48.44 ⁶⁷	08.126 ¹⁴⁸	59.22 ¹⁶¹	37.863 ¹¹²	22.79 ¹⁷²
28.5	23.405 ¹⁶³	47.77 ⁸¹	08.274 ¹⁸³	57.61 ¹⁷¹	37.975 ¹⁴⁸	21.07 ¹⁵³
Sept. 7.4	23.568 ¹⁹²	46.96 ⁹⁸	08.457 ²¹⁵	55.90 ¹⁷⁸	38.123 ¹⁸³	19.54 ¹²²
17.4	23.760 ²²¹	45.98 ¹¹⁴	08.672 ²⁴⁹	54.12 ¹⁸⁵	38.306 ²¹⁶	18.32 ⁸⁵
27.4	23.981 ²⁴⁹	44.84 ¹²⁹	08.921 ²⁸⁰	52.27 ¹⁸⁸	38.522 ²⁴⁸	17.47 ⁴⁵
Oct. 7.3	24.230 ²⁷⁶	43.55 ¹⁴⁴	09.201 ³¹⁰	50.39 ¹⁸⁸	38.770 ²⁷⁹	17.02 ²
17.3	24.506 ²⁹⁹	42.11 ¹⁵⁶	09.511 ³³⁶	48.51 ¹⁸³	39.049 ³⁰⁵	17.04 ⁵⁰
27.3	24.805 ³²⁰	40.55 ¹⁶⁶	09.847 ³⁵⁹	46.68 ¹⁷⁶	39.354 ³²⁴	17.54 ¹⁰¹
Nov. 6.3	25.125 ³³³	38.89 ¹⁶⁹	10.206 ³⁷⁴	44.92 ¹⁶²	39.678 ³³⁶	18.55 ¹⁴⁷
16.2	25.458 ³⁴⁰	37.20 ¹⁶⁹	10.580 ³⁸³	43.30 ¹⁴⁵	40.014 ³⁴¹	20.02 ¹⁹¹
26.2	25.798 ³³⁸	35.51 ¹⁶⁴	10.963 ³⁸⁰	41.85 ¹²¹	40.355 ³³⁶	21.93 ²²⁸
Dec. 6.2	26.136 ³²⁶	33.87 ¹⁵¹	11.343 ³⁶⁸	40.64 ⁹³	40.691 ³²¹	24.21 ²⁶⁰
16.2	26.462 ³⁰⁵	32.36 ¹³⁵	11.711 ³⁴⁴	39.71 ⁶³	41.012 ²⁹⁴	26.81 ²⁸⁴
26.1	26.767 ²⁷³	31.01 ¹¹⁵	12.055 ³⁰⁹	39.08 ³⁰	41.306 ²⁵⁸	29.65 ²⁹⁷
36.1	27.040	29.86	12.364	38.78	41.564	32.62
Mean Place	21.324	54.91	06.026	66.80	36.804	16.58
Secd, Tanδ	1.051	+ 0.325	1.216	+ 0.692	1.110	- 0.481
a, a'	+3.4	-15.1	+3.7	-15.2	+2.7	-15.3
b, b'	-0.02	- 0.7	-0.04	- 0.7	+0.02	- 0.6
Authority and Catalogue No.	B.J.	569	B.J.	571	A.E.	572

† Second transit, Feb. 9

† First transit, Feb. 10

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	κ Argus		α Hydræ		ψ Argus <i>m.</i>	
	2.63	B ₃	2.16	K ₂	3.64	F ₅
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₉ ^m ₂₀	[°] ₅₄ ['] ₄₃	^h ₉ ^m ₂₄	[°] ₈ ['] ₂₂	^h ₉ ^m ₂₈	[°] ₄₀ ['] ₁₀
Jan. 1.1	07.963 ²⁸³	48.15 ³⁶³	25.425 ²³⁹	34.60 ²³⁵	10.059 ²⁵⁸	46.83 ³³⁸
11.1	08.246 ²¹³	51.78 ³⁷⁸	25.664 ¹⁹⁶	36.95 ²²⁴	10.317 ²⁰⁵	50.21 ³⁴⁸
21.1	08.459 ¹³⁷	55.56 ³⁸³	25.860 ¹⁴⁸	39.19 ²⁰⁸	10.522 ¹⁴⁶	53.69 ³⁴⁸
31.0	08.596 ⁶¹	59.39 ³⁷⁸	26.008 ⁹⁹	41.27 ¹⁸⁸	10.668 ⁸⁶	57.17 ³³⁸
Feb. 10.0	08.657 ¹³	63.17 ³⁶³	26.107 ⁴⁹	43.15 ¹⁶⁵	10.754 ²⁷	60.55 ³²¹
19.9	08.644 ⁸³	66.80 ³⁴¹	26.156 ²	44.80 ¹³⁹	10.781 ²⁹	63.76 ²⁹⁸
Mar. 1.9	08.561 ¹⁴⁴	70.21 ³¹⁰	26.158 ⁴⁰	46.19 ¹¹⁴	10.752 ⁷⁹	66.74 ²⁶⁷
11.9	08.417 ¹⁹⁸	73.31 ²⁷⁵	26.118 ⁷⁵	47.33 ⁸⁸	10.673 ¹²²	69.41 ²³³
21.9	08.219 ²⁴¹	76.06 ²³⁵	26.043 ¹⁰³	48.21 ⁶³	10.551 ¹⁵⁶	71.74 ¹⁹⁵
31.9	07.978 ²⁷⁴	78.41 ¹⁹⁰	25.940 ¹²³	48.84 ³⁸	10.395 ¹⁸¹	73.69 ¹⁵⁵
Apr. 10.8	07.704 ²⁹⁴	80.31 ¹⁴³	25.817 ¹³⁴	49.22 ¹⁵	10.214 ¹⁹⁸	75.24 ¹¹³
20.8	07.410 ³⁰⁶	81.74 ⁹⁴	25.683 ¹³⁸	49.37 ⁶	10.016 ²⁰⁶	76.37 ⁶⁹
30.8	07.104 ³⁰⁷	82.68 ⁴³	25.545 ¹³⁵	49.31 ²⁷	09.810 ²⁰⁶	77.06 ²⁵
May 10.8	06.797 ²⁹⁹	83.11 ⁷	25.410 ¹²⁵	49.04 ⁴⁵	09.604 ¹⁹⁹	77.31 ¹⁹
20.7	06.498 ²⁸³	83.04 ⁵⁷	25.285 ¹¹¹	48.59 ⁶³	09.405 ¹⁸⁶	77.12 ⁶¹
30.7	06.215 ²⁶¹	82.47 ¹⁰⁵	25.174 ⁹⁴	47.96 ⁷⁹	09.219 ¹⁶⁸	76.51 ¹⁰¹
June 9.7	05.954 ²²⁹	81.42 ¹⁴⁹	25.080 ⁷³	47.17 ⁹²	09.051 ¹⁴⁵	75.50 ¹³⁹
19.7	05.725 ¹⁹³	79.93 ¹⁸⁹	25.007 ⁵¹	46.25 ¹⁰³	08.906 ¹¹⁹	74.11 ¹⁷²
29.6	05.532 ¹⁵²	78.04 ²²⁴	24.956 ²⁵	45.22 ¹¹¹	08.787 ⁸⁸	72.39 ²⁰¹
July 9.6	05.380 ¹⁰⁶	75.80 ²⁵²	24.931 [—]	44.11 ¹¹⁴	08.699 ⁵⁴	70.38 ²²²
19.6	05.274 ⁵⁵	73.28 ²⁷³	24.931 ²⁷	42.97 ¹¹⁴	08.645 ¹⁹	68.16 ²³⁸
29.5	05.219 [—]	70.55 ²⁸³	24.958 ⁵⁴	41.83 ¹¹⁰	08.626 ¹⁹	65.78 ²⁴⁶
Aug. 8.5	05.219 ⁵⁷	67.72 ²⁸⁶	25.012 ⁸³	40.73 ⁹⁹	08.645 ⁵⁹	63.32 ²⁴⁴
18.5	05.276 ¹¹⁶	64.86 ²⁷⁷	25.095 ¹¹²	39.74 ⁸⁵	08.704 ¹⁰²	60.88 ²³⁴
28.5	05.392 ¹⁷⁷	62.09 ²⁵⁸	25.207 ¹⁴¹	38.89 ⁶⁴	08.806 ¹⁴⁵	58.54 ²¹⁴
Sept. 7.4	05.569 ²³⁵	59.51 ²²⁹	25.348 ¹⁷¹	38.25 ³⁸	08.951 ¹⁸⁸	56.40 ¹⁸⁶
17.4	05.804 ²⁹²	57.22 ¹⁸⁹	25.519 ²⁰²	37.87 ⁹	09.139 ²³⁰	54.54 ¹⁴⁸
27.4	06.096 ³⁴⁵	55.33 ¹⁴²	25.721 ²³¹	37.78 ²⁴	09.369 ²⁷¹	53.06 ¹⁰³
Oct. 7.4	06.441 ³⁹⁰	53.91 ⁸⁷	25.952 ²⁵⁸	38.02 ⁵⁹	09.640 ³⁰⁸	52.03 ⁴
17.3	06.831 ⁴²⁸	53.04 ²⁶	26.210 ²⁸³	38.61 ⁹⁶	09.948 ³³⁸	51.51 ⁴
27.3	07.259 ⁴⁵⁴	52.78 ³⁷	26.493 ³⁰⁴	39.57 ¹³⁰	10.286 ³⁶³	51.55 ⁶¹
Nov. 6.3	07.713 ⁴⁶⁸	53.15 ¹⁰²	26.797 ³¹⁸	40.87 ¹⁶³	10.649 ³⁷⁸	52.16 ¹¹⁹
16.2	08.181 ⁴⁶⁸	54.17 ¹⁶⁴	27.115 ³²⁵	42.50 ¹⁹⁰	11.027 ³⁸³	53.35 ¹⁷³
26.2	08.649 ⁴⁵²	55.81 ²²¹	27.440 ³²²	44.40 ²¹³	11.410 ³⁷⁶	55.08 ²²⁴
Dec. 6.2	09.101 ⁴²²	58.02 ²⁷²	27.762 ³¹²	46.53 ²²⁸	11.786 ³⁵⁷	57.32 ²⁶⁷
16.2	09.523 ³⁷⁹	60.74 ³¹⁵	28.074 ²⁸⁹	48.81 ²³⁶	12.143 ³²⁷	59.99 ³⁰¹
26.1	09.902 ³²²	63.89 ³⁴⁷	28.363 ²⁶⁰	51.17 ²³⁷	12.470 ²⁸⁷	63.00 ³²⁷
36.1	10.224 [—]	67.36 [—]	28.623 [—]	53.54 [—]	12.757 [—]	66.27 [—]
Mean Place	05.956	56.63	23.569	33.42	08.252	52.85
Secδ, Tanδ	1.732	— 1.414	1.011	— 0.147	1.309	— 0.845
<i>a, a'</i>	+1.9	—15.4	+2.9	—15.6	+2.4	—15.8
<i>b, b'</i>	+0.07	— 0.6	+0.01	— 0.6	+0.04	— 0.6
Authority and Catalogue No.	B.J.	573	B.J.	576	B.J.	580

† First transit, Feb. 10

APPARENT PLACES OF STARS, 1935

421

AT UPPER TRANSIT AT GREENWICH

Name	ξ Leonis		θ Ursæ Majoris		N Velorum	
Mag. Spect.	5.12	G5	3.26	F8p	3.04	K5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 9 28	^m +11° 34'	^h 9 28	^m +51° 57'	^h 9 29	^m -56° 44'
Jan. 1.1	28.635	73.16	34.377	75.17	16.677	40.30
11.1	28.889 ²⁵⁴	71.77 ¹³⁹	34.743 ³⁶⁶	75.86 ⁶⁹	16.984 ³⁰⁷	43.90 ³⁶⁰
21.1	29.103 ²¹⁴	70.59 ¹¹⁸	35.047 ³⁰⁴	76.94 ¹⁰⁸	17.217 ²³³	47.67 ³⁷⁷
31.0	29.265 ¹⁶²	69.65 ⁹⁴	35.279 ²³²	78.37 ¹⁴³	17.374 ¹⁵⁷	51.53 ³⁸⁶
Feb. 10.0	29.380 ¹¹⁵	68.96 ⁶⁹	35.433 ¹⁵⁴	80.06 ¹⁶⁹	17.451 ⁷⁷	55.36 ³⁸³
13	29.441 ⁶¹	68.54 ⁴²	35.509 ⁷⁶	81.95 ¹⁸⁹	17.450 ¹	59.06 ³⁷⁰
Mar. 19.9	29.454 ¹³	68.31 ²³	35.508 ¹	83.93 ¹⁹⁸	17.377 ⁷³	62.56 ³⁵⁰
1.9	29.425 ²⁹	68.29 ²	35.436 ⁷²	85.91 ¹⁹⁸	17.238 ¹³⁹	65.79 ³²³
11.9	29.357 ⁶⁸	68.41 ¹²	35.302 ¹³⁴	87.80 ¹⁸⁹	17.041 ¹⁹⁷	68.67 ²⁸⁸
21.9	29.259 ⁹⁸	68.67 ²⁶	35.117 ¹⁸⁵	89.51 ¹⁷¹	16.797 ²⁴⁴	71.15 ²⁴⁸
31.9	29.140 ¹¹⁹	69.01 ³⁴	34.893 ²²⁴	90.98 ¹⁴⁷	16.518 ²⁷⁹	73.20 ²⁰⁵
Apr. 10.8	29.008 ¹³²	69.41 ⁴⁰	34.647 ²⁴⁶	92.13 ¹¹⁵	16.213 ³⁰⁵	74.78 ¹⁵⁸
20.8	28.872 ¹³⁶	69.86 ⁴⁵	34.389 ²⁵⁸	92.94 ⁸¹	15.894 ³¹⁹	75.87 ¹⁰⁹
30.8	28.740 ¹³²	70.30 ⁴⁴	34.133 ²⁵⁶	93.38 ⁴⁴	15.571 ³²³	76.46 ⁵⁹
May 10.8	28.616 ¹²⁴	70.76 ⁴⁶	33.890 ²⁴³	93.43 ⁵	15.252 ³¹⁹	76.53 ⁷
20.7	28.508 ¹⁰⁸	71.18 ⁴²	33.669 ²²¹	93.09 ³⁴	14.947 ³⁰⁵	76.10 ⁴³
June 30.7	28.417 ⁹¹	71.56 ³⁸	33.478 ¹⁹¹	92.38 ⁷¹	14.665 ²⁸²	75.18 ⁹²
9.7	28.349 ⁶⁸	71.93 ³⁷	33.323 ¹⁵⁵	91.32 ¹⁰⁶	14.411 ²⁵⁴	73.79 ¹³⁹
19.7	28.305 ⁴⁴	72.22 ²⁹	33.208 ¹¹⁵	89.92 ¹⁴⁰	14.192 ²¹⁹	71.99 ¹⁸⁰
29.6	28.284 ²¹	72.46 ²⁴	33.137 ⁷¹	88.25 ¹⁶⁷	14.016 ¹⁷⁶	69.83 ²¹⁶
July 9.6	28.292 ⁸	72.62 ¹⁶	33.111 ²⁶	86.33 ¹⁹²	13.887 ¹²⁹	67.37 ²⁴⁶
19.6	28.325 ³³	72.70 ⁸	33.132 ²¹	84.20 ²¹³	13.810 ⁷⁷	64.67 ²⁷⁰
29.5	28.386 ⁶¹	72.66 ⁴	33.200 ⁶⁸	81.89 ²³¹	13.790 ²⁰	61.83 ²⁸⁴
Aug. 8.5	28.473 ⁸⁷	72.49 ¹⁷	33.315 ¹¹⁵	79.45 ²⁴⁴	13.831 ⁴¹	58.96 ²⁸⁷
18.5	28.589 ¹¹⁶	72.16 ³³	33.476 ¹⁶¹	76.93 ²⁵²	13.934 ¹⁰³	56.14 ²⁸²
28.5	28.735 ¹⁴⁶	71.68 ⁴⁸	33.684 ²⁰⁸	74.34 ²⁵⁹	14.101 ¹⁶⁷	53.49 ²⁶⁵
Sept. 7.4	28.909 ¹⁷⁴	70.99 ⁶⁹	33.937 ²⁵³	71.75 ²⁵⁹	14.331 ²³⁰	51.11 ²³⁸
17.4	29.113 ²⁰⁴	70.11 ⁸⁸	34.235 ²⁹⁸	69.20 ²⁵⁵	14.623 ²⁹²	49.09 ²⁰²
27.4	29.345 ²³²	69.02 ¹⁰⁹	34.574 ³³⁹	66.73 ²⁴⁷	14.972 ³⁴⁹	47.54 ¹⁵⁵
Oct. 7.4	29.606 ²⁶¹	67.73 ¹²⁹	34.955 ³⁸¹	64.40 ²³³	15.371 ³⁹⁹	46.53 ¹⁰¹
17.3	29.893 ²⁸⁷	66.26 ¹⁴⁷	35.371 ⁴¹⁶	62.25 ²¹⁵	15.812 ⁴⁴¹	46.11 ⁴²
Nov. 27.3	30.199 ³⁰⁶	64.62 ¹⁶⁴	35.816 ⁴⁴⁵	60.34 ¹⁹¹	16.283 ⁴⁷¹	46.34 ²³
6.3	30.523 ³²⁴	62.86 ¹⁷⁶	36.284 ⁴⁶⁸	58.73 ¹⁶¹	16.771 ⁴⁸⁸	47.22 ⁸⁸
16.2	30.854 ³³¹	61.05 ¹⁸¹	36.763 ⁴⁷⁹	57.46 ¹²⁷	17.261 ⁴⁹⁰	48.73 ¹⁵¹
26.2	31.187 ³³³	59.21 ¹⁸⁴	37.242 ⁴⁷⁹	56.59 ⁸⁷	17.738 ⁴⁷⁷	50.82 ²⁰⁹
Dec. 6.2	31.509 ³²²	57.44 ¹⁷⁷	37.707 ⁴⁶⁵	56.13 ⁴⁶	18.185 ⁴⁴⁷	53.45 ²⁶³
16.2	31.814 ³⁰⁵	55.76 ¹⁶⁸	38.143 ⁴³⁶	56.12 ¹	18.589 ⁴⁰⁴	56.52 ³⁰⁷
26.1	32.087 ²⁷³	54.26 ¹⁵⁰	38.537 ³⁹⁴	56.54 ⁴²	18.936 ³⁴⁷	59.95 ³⁴³
36.1						
Mean Place	26.618	79.26	31.254	88.96	14.691	49.31
Secd, Tanδ	1.021	+ 0.205	1.623	+ 1.279	1.824	- 1.525
a, a'	+3.2	-15.8	+4.1	-15.8	+1.8	-15.9
b, b'	-0.01	- 0.6	-0.07	- 0.6	+0.08	- 0.6
Authority and Catalogue No.	A.E.	583	B.J.	581	A.N.	584

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	κ Hydræ		α Leonis		ϵ Leonis	
	4.96	B ₃	3.76	F ₅ -A ₃	3.12	Gop
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 9 ^m 37	[°] -14 ['] 02	^h 9 ^m 37	[°] +10 ['] 10	^h 9 ^m 42	[°] +24 ['] 03
Jan. 1.1	13.097 ²⁴⁹	11.83 ²⁵⁸	42.916 ²⁶⁰	74.13 ¹⁵⁰	12.031 ²⁸²	78.43 ⁸²
11.1	13.346 ²⁰⁷	14.41 ²⁵²	43.176 ²¹⁹	72.63 ¹²⁸	12.313 ²⁴¹	77.61 ⁵²
21.1	13.553 ¹⁶⁰	16.93 ²⁴⁰	43.395 ¹⁷³	71.35 ¹⁰⁵	12.554 ¹⁹⁰	77.09 ²²
31.0	13.713 ¹⁰⁹	19.33 ²²²	43.568 ¹²²	70.30 ⁸⁰	12.744 ¹³⁷	76.87 ⁶
Feb. 10.0	13.822 ⁶⁰	21.55 ²⁰⁰	43.690 ⁷²	69.50 ⁵⁴	12.881 ⁸²	76.93 ³²
19.9	13.882 ¹³	23.55 ¹⁷⁵	43.762 ²³	68.96 ³¹	12.963 ²⁹	77.25 ⁵³
Mar. 1.9	13.895 ³¹	25.30 ¹⁴⁸	43.785 ²²	68.65 ¹¹	12.992 ¹⁹	77.78 ⁶⁸
11.9	13.864 ⁶⁸	26.78 ¹²⁰	43.763 ⁶⁰	68.54 ⁷	12.973 ⁶²	78.46 ⁷⁸
21.9	13.796 ⁹⁷	27.98 ⁹¹	43.703 ⁹⁰	68.61 ²⁰	12.911 ⁹⁷	79.24 ⁸³
31.9	13.699 ¹¹⁹	28.89 ⁶³	43.613 ¹¹³	68.81 ³¹	12.814 ¹²²	80.07 ⁸³
Apr. 10.9	13.580 ¹³²	29.52 ³⁸	43.500 ¹²⁶	69.12 ³⁹	12.692 ¹³⁸	80.90 ⁷⁸
20.8	13.448 ¹³⁹	29.90 ¹¹	43.374 ¹³²	69.51 ⁴³	12.554 ¹⁴⁶	81.68 ⁶⁹
30.8	13.309 ¹³⁷	30.01 ¹⁵	43.242 ¹³¹	69.94 ⁴⁶	12.408 ¹⁴⁴	82.37 ⁵⁸
May 10.8	13.172 ¹³⁰	29.86 ³⁸	43.111 ¹²³	70.40 ⁴⁶	12.264 ¹³⁷	82.95 ⁴⁵
20.7	13.042 ¹¹⁹	29.48 ⁶¹	42.988 ¹¹⁰	70.86 ⁴⁶	12.127 ¹²⁴	83.40 ³⁰
30.7	12.923 ¹⁰³	28.87 ⁸¹	42.878 ⁹³	71.32 ⁴⁴	12.003 ¹⁰⁵	83.70 ¹⁴
June 9.7	12.820 ⁸⁵	28.06 ⁹⁹	42.785 ⁷³	71.76 ⁴⁰	11.898 ⁸⁴	83.84 ¹
19.7	12.735 ⁶³	27.07 ¹¹⁵	42.712 ⁵¹	72.16 ³⁶	11.814 ⁶⁰	83.83 ¹⁶
29.6	12.672 ³⁹	25.92 ¹²⁶	42.661 ²⁷	72.52 ³⁰	11.754 ³⁴	83.67 ³²
July 9.6	12.633 ¹⁵	24.66 ¹³⁴	42.634 ¹	72.82 ²³	11.720 ⁶	83.35 ⁴⁸
19.6	12.618 ¹¹	23.32 ¹³⁷	42.633 ²⁵	73.05 ¹⁴	11.714 ²¹	82.87 ⁶²
29.6	12.629 ³⁹	21.95 ¹³⁵	42.658 ⁵¹	73.19 ³	11.735 ⁵¹	82.25 ⁷⁸
Aug. 8.5	12.668 ⁶⁷	20.60 ¹²⁷	42.709 ⁷⁸	73.22 ¹⁰	11.786 ⁷⁹	81.47 ⁹³
18.5	12.735 ⁹⁸	19.33 ¹¹⁴	42.787 ¹⁰⁷	73.12 ²⁶	11.865 ¹¹⁰	80.54 ¹⁰⁹
28.5	12.833 ¹²⁹	18.19 ⁹³	42.894 ¹³⁵	72.86 ⁴³	11.975 ¹⁴¹	79.45 ¹²³
Sept. 7.4	12.962 ¹⁶⁰	17.26 ⁶⁸	43.029 ¹⁶⁵	72.43 ⁶³	12.116 ¹⁷²	78.22 ¹³⁸
17.4	13.122 ¹⁹²	16.58 ³⁸	43.194 ¹⁹⁵	71.80 ⁸³	12.288 ²⁰⁴	76.84 ¹⁵²
27.4	13.314 ²²⁵	16.20 ²	43.389 ²²⁵	70.97 ¹⁰⁵	12.492 ²³⁵	75.32 ¹⁶⁵
Oct. 7.4	13.539 ²⁵⁴	16.18 ³⁷	43.614 ²⁵³	69.92 ¹²⁷	12.727 ²⁶⁷	73.67 ¹⁷⁶
17.3	13.793 ²⁸¹	16.55 ⁷⁶	43.867 ²⁸⁰	68.65 ¹⁴⁷	12.994 ²⁹⁵	71.91 ¹⁸³
27.3	14.074 ³⁰⁴	17.31 ¹¹⁶	44.147 ³⁰³	67.18 ¹⁶⁴	13.289 ³²⁰	70.08 ¹⁸⁶
Nov. 6.3	14.378 ³²⁰	18.47 ¹⁵⁴	44.450 ³²⁰	65.54 ¹⁷⁷	13.609 ³³⁹	68.22 ¹⁸⁵
16.3	14.698 ³²⁹	20.01 ¹⁸⁷	44.770 ³³⁰	63.77 ¹⁸⁶	13.948 ³⁵²	66.37 ¹⁷⁸
26.2	15.027 ³²⁸	21.88 ²¹⁶	45.100 ³³²	61.91 ¹⁸⁸	14.300 ³⁵⁴	64.59 ¹⁶⁷
Dec. 6.2	15.355 ³¹⁹	24.04 ²³⁸	45.432 ³²⁴	60.03 ¹⁸⁵	14.654 ³⁴⁸	62.92 ¹⁴⁸
16.2	15.674 ²⁹⁹	26.42 ²⁵¹	45.756 ³⁰⁷	58.18 ¹⁷⁶	15.002 ³³⁰	61.44 ¹²⁶
26.1	15.973 ²⁶⁹	28.93 ²⁵⁸	46.063 ²⁷⁹	56.42 ¹⁶²	15.332 ³⁰²	60.18 ⁹⁹
36.1	16.242	31.51	46.342	54.80	15.634	59.19
Mean Place	11.325	11.82	40.959	80.27	09.892	88.10
Sec δ , Tan δ	1.031	-0.250	1.016	+0.180	1.095	+0.447
a , a'	+2.9	-16.3	+3.2	-16.3	+3.4	-16.5
b , b'	+0.01	-0.6	-0.01	-0.6	-0.02	-0.6
Authority and Catalogue No.	A.N.	593	A.N.	594	B.J.	597

APPARENT PLACES OF STARS, 1935

423

AT UPPER TRANSIT AT GREENWICH

Name Mag. Spect.	ν Argus		ν Ursæ Majoris		μ Leonis	
	3.15	Fo	3.89	Fo	4.10	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 9 45	^m -64 46	^h 9 46	^m +59 20	^h 9 49	^m +26 18
Jan. 1.1	30.72	01.04	26.527	27.97	06.379	39.85
11.1	31.11	04.55	26.974	28.83	06.671	39.10
21.1	31.41	08.31	27.350	30.15	06.920	38.67
31.0	31.62	12.22	27.646	31.84	07.120	38.55
Feb. 10.0	31.73	16.17	27.852	33.85	07.266	38.73
19.9	31.75	20.05	27.966	36.07	07.356	39.17
Mar. 1.9	31.67	23.79	27.987	38.39	07.393	39.82
11.9	31.51	27.30	27.922	40.73	07.380	40.63
21.9	31.27	30.50	27.779	42.96	07.323	41.54
31.9	30.97	33.33	27.570	45.00	07.230	42.49
Apr. 10.9	30.62	35.75	27.310	46.76	07.109	43.42
20.8	30.23	37.72	27.015	48.18	06.971	44.29
30.8	29.82	39.19	26.699	49.20	06.824	45.06
May 10.8	29.39	40.14	26.376	49.79	06.676	45.69
20.7	28.96	40.57	26.063	49.94	06.535	46.16
30.7	28.54	40.47	25.769	49.64	06.406	46.46
June 9.7	28.13	39.85	25.506	48.90	06.294	46.59
19.7	27.76	38.73	25.280	47.76	06.203	46.54
29.6	27.42	37.13	25.099	46.23	06.136	46.30
July 9.6	27.14	35.12	24.968	44.37	06.094	45.89
19.6	26.91	32.76	24.890	42.20	06.080	45.31
29.6	26.75	30.10	24.867	39.78	06.094	44.56
Aug. 8.5	26.67	27.24	24.900	37.15	06.137	43.65
18.5	26.66	24.28	24.991	34.37	06.210	42.58
28.5	26.73	21.31	25.140	31.48	06.314	41.35
Sept. 7.4	26.89	18.46	25.346	28.54	06.448	39.97
17.4	27.13	15.82	25.608	25.59	06.615	38.45
27.4	27.46	13.51	25.927	22.69	06.816	36.79
Oct. 7.4	27.87	11.62	26.300	19.91	07.049	35.02
17.3	28.34	10.25	26.724	17.29	07.313	33.16
27.3	28.88	09.46	27.193	14.90	07.608	31.24
Nov. 6.3	29.45	09.31	27.701	12.80	07.929	29.30
16.3	30.05	09.82	28.240	11.04	08.270	27.40
26.2	30.66	10.99	28.798	09.69	08.625	25.59
Dec. 6.2	31.26	12.79	29.359	08.79	08.985	23.92
16.2	31.82	15.16	29.910	08.37	09.339	22.45
26.1	32.33	18.04	30.433	08.46	09.677	21.23
36.1	32.77	21.33	30.910	09.03	09.987	20.30
Mean Place	28.629	11.59	23.042	44.13	04.237	50.39
Secd, Tan δ	2.346	- 2.122	1.961	+ 1.687	1.116	+ 0.495
a, a'	+1.5	-16.7	+4.3	-16.7	+3.4	-16.9
b, b'	+0.12	- 0.6	-0.09	- 0.6	-0.03	- 0.5
Authority and Catalogue No.	B.J.	600	B.J.	601	A.N.	603

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	π Leonis		α Leonis (<i>Regulus</i>)		γ Velorum	
	4.89	Ma	1.34	B8	4.09	A2
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₉ ^m ₅₆	+ [°] ₈ ['] ₂₀	^h ₁₀ ^m ₀₄	+ [°] ₁₂ ['] ₁₆	^h ₁₀ ^m ₁₂	- [°] ₄₁ ['] ₄₇
Jan. 1.1	48.617 ²⁷²	78.40 ¹⁶⁶	56.562 ²⁸²	60.62 ¹⁵⁰	01.794 ³¹¹	50.70 ³²²
11.1	48.889 ²³⁴	76.74 ¹⁴⁴	56.844 ²⁴³	59.12 ¹²⁶	02.105 ²⁶²	53.92 ³³⁹
21.1	49.123 ¹⁸⁹	75.30 ¹²⁰	57.087 ¹⁹⁹	57.86 ¹⁰⁰	02.367 ²⁰⁷	57.31 ³⁴⁶
31.1	49.312 ¹⁴⁰	74.10 ⁹⁵	57.286 ¹⁵⁰	56.86 ⁷²	02.574 ¹⁴⁸	60.77 ³⁴⁴
Feb. 10.0	49.452 ⁹⁰	73.15 ⁶⁸	57.436 ¹⁰⁰	56.14 ⁴⁶	02.722 ⁸⁹	64.21 ³³⁵
20.0	49.542 [†]	72.47 ⁴⁴	57.536 ⁵⁰	55.68 ²⁰	02.811 ³¹	67.56 ³¹⁶
Mar. 1.9	49.583 ³	72.03 ²²	57.586 ⁴	55.48 ¹	02.842 ²²	70.72 ²⁹³
11.9	49.580 ⁴³	71.81 ³	57.590 ³⁶	55.49 ³⁰	02.820 ⁶⁹	73.65 ²⁶⁴
21.9	49.537 ⁷⁵	71.78 ¹⁴	57.554 ⁷⁰	55.69 ²⁴	02.751 ¹¹⁰	76.29 ²³¹
31.9	49.462 ⁹⁹	71.92 ²⁷	57.484 ⁹⁵	56.03 ⁴⁵	02.641 ¹⁴¹	78.60 ¹⁹⁴
Apr. 10.9	49.363 ¹¹⁵	72.19 ³⁶	57.389 ¹¹³	56.48 ⁵²	02.500 ¹⁶⁶	80.54 ¹⁵⁴
20.8	49.248 ¹²⁴	72.55 ⁴²	57.276 ¹²³	57.00 ⁵⁴	02.334 ¹⁸²	82.08 ¹¹³
30.8	49.124 ¹²⁵	72.97 ⁴⁷	57.153 ¹²⁶	57.54 ⁵⁴	02.152 ¹⁹¹	83.21 ⁷⁰
May 10.8	48.999 ¹²¹	73.44 ⁵⁰	57.027 ¹²²	58.08 ⁵³	01.961 ¹⁹⁴	83.91 ²⁷
20.8	48.878 ¹¹¹	73.94 ⁵⁰	56.905 ¹¹⁴	58.61 ⁵⁰	01.767 ¹⁸⁹	84.18 ¹⁶
30.7	48.767 ⁹⁷	74.44 ⁴⁸	56.791 ¹⁰¹	59.11 ⁴⁴	01.578 ¹⁸¹	84.02 ⁵⁸
June 9.7	48.670 ⁸⁰	74.92 ⁴⁷	56.690 ⁸⁵	59.55 ³⁸	01.397 ¹⁶⁷	83.44 ⁹⁷
19.7	48.590 ⁶²	75.39 ⁴⁴	56.605 ⁶⁶	59.93 ³¹	01.230 ¹⁴⁷	82.47 ¹³⁴
29.7	48.528 ⁴⁰	75.83 ³⁸	56.539 ⁴⁵	60.24 ²²	01.083 ¹²⁴	81.13 ¹⁶⁸
July 9.6	48.488 ¹⁷	76.21 ³¹	56.494 ²³	60.46 ¹³	00.959 ⁹⁸	79.45 ¹⁹⁶
19.6	48.471 ⁷	76.52 ²²	56.471 [—]	60.59 ¹	00.861 ⁶⁶	77.49 ²¹⁸
29.6	48.478 ³³	76.74 ¹¹	56.471 ²⁵	60.60 ¹²	00.795 ³²	75.31 ²³²
Aug. 8.5	48.511 ⁵⁹	76.85 ¹	56.496 ⁵²	60.48 ²⁵	00.763 ⁷	72.99 ²³⁸
18.5	48.570 ⁸⁶	76.84 ¹⁸	56.548 ⁷⁹	60.23 ⁴³	00.770 ⁴⁸	70.61 ²³⁶
28.5	48.656 ¹¹⁵	76.66 ³⁶	56.627 ¹⁰⁹	59.80 ⁶⁰	00.818 ⁹⁴	68.25 ²²⁵
Sept. 7.5	48.771 ¹⁴⁶	76.30 ⁵⁶	56.736 ¹³⁹	59.20 ⁸⁰	00.912 ¹⁴⁰	66.00 ²⁰⁴
17.4	48.917 ¹⁷⁷	75.74 ⁷⁸	56.875 ¹⁷¹	58.40 ¹⁰⁰	01.052 ¹⁸⁸	63.96 ¹⁷⁴
27.4	49.094 ²⁰⁹	74.96 ¹⁰¹	57.046 ²⁰⁴	57.40 ¹²⁰	01.240 ²³⁵	62.22 ¹³⁵
Oct. 7.4	49.303 ²⁴⁰	73.95 ¹²⁴	57.250 ²³⁶	56.20 ¹⁴¹	01.475 ²⁷⁹	60.87 ⁸⁹
17.4	49.543 ²⁶⁹	72.71 ¹⁴⁶	57.486 ²⁶⁶	54.79 ¹⁶¹	01.754 ³²¹	59.98 ³⁸
27.3	49.812 ²⁹⁴	71.25 ¹⁶⁵	57.752 ²⁹³	53.18 ¹⁷⁶	02.075 ³⁵⁴	59.60 ⁷⁸
Nov. 6.3	50.106 ³¹⁵	69.60 ¹⁸¹	58.045 ³¹⁵	51.42 ¹⁸⁷	02.429 ³⁸¹	59.78 ⁷⁶
16.3	50.421 ³²⁸	67.79 ¹⁹²	58.360 ³³⁰	49.55 ¹⁹⁵	02.810 ³⁹⁵	60.54 ¹³¹
26.2	50.749 ³³⁴	65.87 ¹⁹⁸	58.690 ³³⁷	47.60 ¹⁹⁶	03.205 ³⁹⁹	61.85 ¹⁸⁴
Dec. 6.2	51.083 ³²⁹	63.89 ¹⁹⁶	59.027 ³³⁵	45.64 ¹⁹⁰	03.604 ³⁹⁰	63.69 ²³³
16.2	51.412 ³¹⁴	61.93 ¹⁸⁸	59.362 ³²¹	43.74 ¹⁷⁹	03.994 ³⁶⁹	66.02 ²⁷³
26.2	51.726 ²⁸⁹	60.05 ¹⁷⁶	59.683 ²⁹⁸	41.95 ¹⁶³	04.363 ³³⁵	68.75 ³⁰⁵
36.1	52.015	58.29	59.981	40.32	04.698	71.80
Mean Place	46.764	84.85	54.706	68.45	00.209	57.44
Sec δ , Tan δ	1.011	+ 0.147	1.023	+ 0.218	1.341	- 0.894
a, a'	+3.2	-17.2	+3.2	-17.6	+2.5	-17.9
b, b'	-0.01	- 0.5	-0.01	- 0.5	+0.05	- 0.5
Authority and Catalogue No.	B.J.	612	B.J.	617	B.J.	619

† First transit, Feb. 20

APPARENT PLACES OF STARS, 1935

425

AT UPPER TRANSIT AT GREENWICH

Name	22 Sextantis		<i>γ</i> Carinæ		<i>γ</i> ¹ Leonis	
Mag. Spect.	5.40	Fo	3.44	K5	2.61	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 10 ^m 14	[°] — 7 ['] 44	^h 10 ^m 14	[°] — 61 ['] 00	^h 10 ^m 16	[°] + 20 ['] 09
Jan. 1.1	25.589	39.19	56.36	14.79	25.377	65.02
11.1	25.866	41.53	56.77	18.09	25.678	63.82
21.1	26.106	43.79	57.11	21.69	25.940	62.91
31.1	26.303	45.90	57.37	25.48	26.158	62.32
Feb. 10.0	26.453	47.82	57.55	29.35	26.326	62.04
20.0	26.554	49.51	57.64	33.21	26.444	62.05
Mar. 1.9	26.608	50.96	57.65	36.96	26.510	62.32
11.9	26.618	52.16	57.58	40.53	26.527	62.79
21.9	26.589	53.09	57.45	43.83	26.500	63.43
31.9	26.528	53.78	57.25	46.81	26.438	64.18
Apr. 10.9	26.441	54.24	57.00	49.42	26.346	64.98
20.8	26.336	54.47	56.71	51.60	26.234	65.78
30.8	26.220	54.49	56.39	53.32	26.109	66.56
May 10.8	26.099	54.33	56.05	54.56	25.980	67.27
20.8	25.980	53.99	55.71	55.29	25.852	67.87
30.7	25.866	53.49	55.36	55.50	25.730	68.36
June 9.7	25.762	52.85	55.02	55.19	25.620	68.72
19.7	25.671	52.10	54.70	54.39	25.526	68.94
29.7	25.597	51.24	54.40	53.11	25.450	69.01
July 9.6	25.540	50.30	54.14	51.39	25.394	68.93
19.6	25.504	49.33	53.92	49.29	25.361	68.69
29.6	25.490	48.35	53.75	46.87	25.351	68.29
Aug. 8.5	25.499	47.40	53.64	44.21	25.367	67.72
18.5	25.535	46.54	53.59	41.39	25.410	66.99
28.5	25.598	45.79	53.61	38.52	25.481	66.08
Sept. 7.5	25.691	45.23	53.71	35.69	25.583	64.99
17.4	25.817	44.88	53.88	33.03	25.716	63.72
27.4	25.975	44.80	54.13	30.63	25.883	62.27
Oct. 7.4	26.167	45.03	54.46	28.61	26.084	60.65
17.4	26.393	45.58	54.85	27.06	26.318	58.88
27.3	26.650	46.48	55.30	26.04	26.584	56.99
Nov. 6.3	26.935	47.71	55.80	25.63	26.881	55.01
16.3	27.244	49.27	56.33	25.86	27.203	52.99
26.2	27.568	51.10	56.88	26.73	27.542	50.98
Dec. 6.2	27.899	53.16	57.44	28.24	27.890	49.05
16.2	28.228	55.40	57.98	30.33	28.238	47.26
26.2	28.545	57.73	58.48	32.95	28.576	45.65
36.1	28.838	60.09	58.93	36.02	28.892	44.29
Mean Place	23.948	36.75	54.628	25.36	23.483	75.45
Secδ, Tanδ	1.009	— 0.136	2.063	— 1.805	1.065	+ 0.367
<i>a</i> , <i>a'</i>	+3.0	— 18.0	+2.0	— 18.0	+3.3	— 18.0
<i>b</i> , <i>b'</i>	+0.01	— 0.4	+0.11	— 0.4	— 0.02	— 0.4
Authority and Catalogue No.	N.A.	624	A.N.	625	A.N.	627

(330/3544)

(NAUTICAL ALMANAC, 1935)

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APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	μ Ursæ Majoris		μ Hydræ		α Antilæ	
Mag. Spect.	3.21	K5	4.06	K5	4.42	K5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₀ ^m ₁₈	+41° ^m ₄₉	^h ₁₀ ^m ₂₂	-16° ^m ₃₀	^h ₁₀ ^m ₂₄	-30° ^m ₄₄
Jan. 1.2	30.163 ³⁵⁹	21.85 ²²	58.247 ²⁸⁵	13.88 ²⁶³	11.951 ³⁰⁰	05.82 ²⁹⁷
11.1	30.522 ³¹⁵	21.63 ²¹	58.532 ²⁴⁸	16.51 ²⁶¹	12.251 ²⁵⁹	08.79 ³⁰⁸
21.1	30.837 ²⁶²	21.84 ⁶¹	58.780 ²⁰⁴	19.12 ²⁵³	12.510 ²¹¹	11.87 ³¹⁰
31.1	31.099 ²⁰¹	22.45 ⁹⁹	58.984 ¹⁵⁷	21.65 ²³⁹	12.721 ¹⁶⁰	14.97 ³⁰³
Feb. 10.0	31.300 ¹³⁷	23.44 ¹²⁹	59.141 ¹⁰⁸	24.04 ²²⁰	12.881 ¹⁰⁷	18.00 ²⁹⁰
20.0	31.437 ⁷²	24.73 ¹⁵²	59.249 ⁶⁰	26.24 ¹⁹⁷	12.988 ⁵⁶	20.90 ²⁷¹
Mar. 1.9	31.509 ¹²	26.25 ¹⁶⁷	59.309 ¹⁵	28.21 ¹⁷¹	13.044 ⁷	23.61 ²⁴⁷
11.9	31.521 ⁴⁴	27.92 ¹⁷³	59.324 ²⁵	29.92 ¹⁴⁴	13.051 ³⁶	26.08 ²¹⁹
21.9	31.477 ⁹²	29.65 ¹⁷¹	59.299 ⁵⁸	31.36 ¹¹⁷	13.015 ⁷²	28.27 ¹⁸⁸
31.9	31.385 ¹³⁰	31.36 ¹⁶¹	59.241 ⁸⁵	32.53 ⁸⁹	12.943 ¹⁰²	30.15 ¹⁵⁴
Apr. 10.9	31.255 ¹⁵⁹	32.97 ¹⁴⁴	59.156 ¹⁰⁵	33.42 ⁶¹	12.841 ¹²⁴	31.69 ¹²¹
20.9	31.096 ¹⁷⁷	34.41 ¹²¹	59.051 ¹¹⁷	34.03 ³⁵	12.717 ¹³⁸	32.90 ⁸⁵
30.8	30.919 ¹⁸⁶	35.62 ⁹⁴	58.934 ¹²⁴	34.38 ⁹	12.579 ¹⁴⁷	33.75 ⁴⁹
May 10.8	30.733 ¹⁸⁵	36.56 ⁶⁵	58.810 ¹²⁴	34.47 ¹⁶	12.432 ¹⁵⁰	34.24 ¹³
20.8	30.548 ¹⁷⁸	37.21 ³²	58.686 ¹²¹	34.31 ⁴⁰	12.282 ¹⁴⁷	34.37 ²²
30.7	30.370 ¹⁶³	37.53 [—]	58.565 ¹¹³	33.91 ⁶³	12.135 ¹⁴¹	34.15 ⁵⁵
June 9.7	30.207 ¹⁴⁴	37.53 ³³	58.452 ¹⁰¹	33.28 ⁸²	11.994 ¹²⁹	33.60 ⁸⁸
19.7	30.063 ¹²⁰	37.20 ⁶⁵	58.351 ⁸⁸	32.46 ¹⁰⁰	11.865 ¹¹⁴	32.72 ¹¹⁹
29.7	29.943 ⁹²	36.55 ⁹⁵	58.263 ⁶⁹	31.46 ¹¹⁵	11.751 ⁹⁷	31.53 ¹⁴⁴
July 9.6	29.851 ⁶³	35.60 ¹²³	58.194 ⁵¹	30.31 ¹²⁵	11.654 ⁷⁴	30.09 ¹⁶⁵
19.6	29.788 ³¹	34.37 ¹⁴⁹	58.143 ²⁹	29.06 ¹³²	11.580 ⁵⁰	28.44 ¹⁸¹
29.6	29.757 ²	32.88 ¹⁷³	58.114 ⁴	27.74 ¹³⁴	11.530 ²³	26.63 ¹⁹²
Aug. 8.6	29.759 ³⁸	31.15 ¹⁹⁴	58.110 ²²	26.40 ¹³¹	11.507 ⁹	24.71 ¹⁹⁴
18.5	29.797 ⁷⁵	29.21 ²¹²	58.132 ⁵²	25.09 ¹²¹	11.516 ⁴³	22.77 ¹⁹⁰
28.5	29.872 ¹¹³	27.09 ²²⁸	58.184 ⁸³	23.88 ¹⁰⁴	11.559 ⁸⁰	20.87 ¹⁷⁸
Sept. 7.5	29.985 ¹⁵³	24.81 ²³⁹	58.267 ¹¹⁷	22.84 ⁸⁴	11.639 ¹¹⁹	19.09 ¹⁵⁶
17.4	30.138 ¹⁹³	22.42 ²⁴⁸	58.384 ¹⁵³	22.00 ⁵⁵	11.758 ¹⁶⁰	17.53 ¹²⁹
27.4	30.331 ²³⁵	19.94 ²⁵³	58.537 ¹⁸⁸	21.45 ²³	11.918 ²⁰¹	16.24 ⁹³
Oct. 7.4	30.566 ²⁷⁵	17.41 ²⁵²	58.725 ²²⁵	21.22 ¹⁴	12.119 ²⁴²	15.31 ⁵¹
17.4	30.841 ³¹⁵	14.89 ²⁴⁷	58.950 ²⁵⁹	21.36 ⁵³	12.361 ²⁸⁰	14.80 ⁵
27.3	31.156 ³⁵⁰	12.42 ²³⁶	59.209 ²⁸⁸	21.89 ⁹⁴	12.641 ³¹³	14.75 ⁴⁵
Nov. 6.3	31.506 ³⁷⁹	10.06 ²¹⁸	59.497 ³¹⁴	22.83 ¹³³	12.954 ³³⁹	15.20 ⁹⁵
16.3	31.885 ⁴⁰²	07.88 ¹⁹⁵	59.811 ³³⁰	24.16 ¹⁷⁰	13.293 ³⁵⁷	16.15 ¹⁴³
26.3	32.287 ⁴¹³	05.93 ¹⁶⁵	60.141 ³³⁹	25.86 ²⁰²	13.650 ³⁶⁴	17.58 ¹⁸⁸
Dec. 6.2	32.700 ⁴¹⁴	04.28 ¹³⁰	60.480 ³³⁷	27.88 ²²⁸	14.014 ³⁶⁰	19.46 ²²⁸
16.2	33.114 ⁴⁰²	02.98 ⁹¹	60.817 ³²⁴	30.16 ²⁴⁷	14.374 ³⁴⁵	21.74 ²⁶¹
26.2	33.516 ³⁷⁷	02.07 ⁴⁸	61.141 ³⁰²	32.63 ²⁵⁸	14.719 ³¹⁹	24.35 ²⁸⁵
36.1	33.893	01.59	61.443	35.21	15.038	27.20
Mean Place	27.837	37.55	56.690	13.85	10.438	09.80
Secd, Tan δ	1.342	+0.895	1.043	-0.296	1.163	-0.595
α, α'	+3.6	-18.1	+2.9	-18.3	+2.8	-18.3
b, b'	-0.05	-0.4	+0.02	-0.4	+0.04	-0.4
Authority and Catalogue No.	B.J.	628	B.J.	633	B.J.	636

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

427

Name	ρ Leonis		34 Sextantis		θ Argus	
Mag. Spect.	3.85	Bop	6.63	F5	3.03	Bo
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 10 ^m 29	[°] + 9 ['] 38	^h 10 ^m 39	[°] + 3 ['] 54	^h 10 ^m 40	[°] - 64 ['] 03
Jan. 1.2	25.069 ²⁹⁴	22.06 ¹⁷⁰	17.701 ²⁹⁶	76.96 ¹⁹⁵	39.54	00.76
11.1	25.363 ²⁶⁰	20.36 ¹⁴⁸	17.997 ²⁶³	75.01 ¹⁷⁷	40.03 ⁴⁹	03.83 ³⁰⁷
21.1	25.623 ²¹⁹	18.88 ¹²²	18.260 ²²³	73.24 ¹⁵⁴	40.45 ⁴²	07.26 ³⁴³
31.1	25.842 ¹⁷²	17.66 ⁹⁴	18.483 ¹⁷⁹	71.70 ¹³⁰	40.78 ³³	10.93 ³⁶⁷
Feb. 10.1	26.014 ¹²⁴	16.72 ⁶⁷	18.662 ¹³⁰	70.40 ¹⁰²	41.03 ²⁵	14.76 ³⁸³
20.0	26.138 ⁷⁵	16.05 ⁴⁰	18.792 ⁸³	69.38 ⁷⁷	41.19 ¹⁶	14.76 ³⁸⁹
Mar. 2.0	26.213 ³⁰	15.65 ¹⁵	18.875 ³²	68.61 ⁵¹	41.26 ⁷	18.65 ³⁸⁴
11.9	26.243 ¹²	15.50 ⁶	18.914 ³	68.10 ²⁸	41.24 ²	22.49 ³⁷²
21.9	26.231 ⁴⁷	15.56 ²³	18.911 ³⁷	67.82 ¹	41.14 ¹⁰	26.21 ³⁷²
31.9	26.184 ⁷⁴	15.79 ³⁷	18.874 ⁶⁵	67.75 ¹¹	41.14 ¹⁷	29.72 ³⁵¹
Apr. 10.9	26.110 ⁹⁵	16.16 ⁴⁶	18.809 ⁸⁷	67.86 ²⁴	40.97 ²³	32.96 ³²⁴
20.9	26.015 ¹⁰⁹	16.62 ⁵³	18.722 ¹⁰¹	68.10 ³⁶	40.74 ²⁷	35.86 ²⁹⁰
30.8	25.906 ¹¹⁶	17.15 ⁵⁶	18.621 ¹¹⁰	68.46 ⁴⁵	40.47 ³²	38.37 ²⁵¹
May 10.8	25.790 ¹¹⁶	17.71 ⁵⁷	18.511 ¹¹¹	68.91 ⁴⁹	40.15 ³⁵	40.45 ²⁰⁸
20.8	25.674 ¹¹²	18.28 ⁵⁵	18.400 ¹⁰⁹	69.40 ⁵⁵	39.80 ³⁸	42.06 ¹⁶¹
30.8	25.562 ¹⁰³	18.83 ⁵²	18.291 ¹⁰³	69.95 ⁵⁷	39.42 ³⁸	43.18 ¹¹²
June 9.7	25.459 ⁹¹	19.35 ⁴⁸	18.188 ⁹²	70.52 ⁵⁷	39.04 ³⁸	43.78 ⁶⁰
19.7	25.368 ⁷⁷	19.83 ⁴¹	18.096 ⁸¹	71.09 ⁵⁶	38.66 ³⁸	43.85 ⁷
29.7	25.291 ⁶⁰	20.24 ³³	18.015 ⁶⁴	71.09 ⁵⁶	38.29 ³⁷	43.41 ⁴⁴
July 9.6	25.231 ⁴⁰	20.57 ²⁵	17.951 ⁴⁸	71.65 ⁵³	37.94 ³⁵	42.45 ⁹⁶
19.6	25.191 ²⁰	20.82 ¹⁵	17.903 ²⁸	72.18 ⁴⁸	37.61 ³³	42.45 ¹⁴¹
29.6	25.171 ³	20.97 ¹	17.875 ⁷	72.66 ⁴¹	37.61 ²⁸	41.04 ¹⁸⁵
Aug. 8.6	25.174 ²⁸	20.98 ¹³	17.868 ¹⁷	73.07 ³¹	37.33 ²⁴	39.19 ²²²
18.5	25.202 ⁵⁴	20.85 ²⁹	17.885 ⁴³	73.38 ¹⁹	37.09 ¹⁸	36.97 ²⁵²
28.5	25.256 ⁸⁴	20.56 ⁴⁸	17.928 ⁷²	73.57 ⁴	36.91 ¹¹	34.45 ²⁷⁴
Sept. 7.5	25.340 ¹¹⁴	20.08 ⁶⁸	18.000 ¹⁰³	73.61 ¹⁴	36.80 ¹¹	31.71 ²⁸⁷
17.5	25.454 ¹⁴⁷	19.40 ⁹⁰	18.103 ¹³⁵	73.47 ³⁶	36.77 ⁵	28.84 ²⁸⁸
27.4	25.601 ¹⁸¹	18.50 ¹¹²	18.238 ¹⁷¹	73.11 ⁵⁸	36.82 ¹³	25.96 ²⁷⁹
Oct. 7.4	25.782 ²¹⁶	17.38 ¹³⁵	18.409 ²⁰⁵	72.53 ⁸³	36.95 ¹³	23.17 ²⁵⁹
17.4	25.998 ²⁴⁸	16.03 ¹⁵⁷	18.614 ²⁴⁰	71.70 ¹¹⁰	37.16 ²¹	20.58 ²⁵⁹
27.3	26.246 ²⁷⁸	14.46 ¹⁷⁵	18.854 ²⁷¹	70.60 ¹³⁴	37.16 ³¹	18.30 ²²⁸
Nov. 6.3	26.524 ³⁰⁴	12.71 ¹⁹⁰	19.125 ²⁹⁷	69.26 ¹⁵⁹	37.47 ³⁹	16.43 ¹³⁶
16.3	26.828 ³²⁴	10.81 ²⁰¹	19.422 ³¹⁹	67.67 ¹⁸⁰	38.32 ⁵²	15.07 ⁷⁹
26.3	27.152 ³³⁵	08.80 ²⁰⁶	19.741 ³³¹	65.87 ¹⁹⁶	38.84 ⁵⁸	14.28 ¹⁷
Dec. 6.2	27.487 ³³⁶	06.74 ²⁰³	20.072 ³³⁴	63.91 ²⁰⁸	39.42 ⁶⁰	14.11 ⁴⁷
16.2	27.823 ³²⁸	04.71 ¹⁹⁵	20.406 ³²⁷	61.83 ²¹²	40.02 ⁶¹	14.58 ¹¹²
26.2	28.151 ³⁰⁸	02.76 ¹⁸⁰	20.733 ³⁰⁸	59.71 ²¹⁰	40.63 ⁶⁰	15.70 ¹⁷³
36.2	28.459	00.96	21.041	57.61 ²⁰²	41.23 ⁵⁸	17.43 ²³⁰
				55.59	41.81 ⁵²	19.73 ²⁷⁹
					42.33	22.52
Mean Place	23.369	30.06	16.103	83.57	37.981	12.19
Sec δ , Tan δ	1.014	+ 0.170	1.002	+ 0.069	2.285	- 2.055
a, a'	+3.2	-18.5	+3.1	-18.8	+2.1	-18.9
b, b'	-0.01	- 0.4	0.00	- 0.3	+0.13	- 0.3
Authority and Catalogue No.	A.N.	641	N.A.	654	B.J.	656

§ Transit, Mar. 1

† First transit, Mar. 2

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	η Argus		μ Argus		ι Leonis	
Mag. Spect.	Var.	Pec.	2.86	G5	5.27	Ao
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 10 ^m 42	[°] -59 ['] 20	^h 10 ^m 43	[°] -49 ['] 04	^h 10 ^m 45	[°] +10 ['] 52
Jan. 1.2	33.498	21.72	59.550	25.57	52.101	73.90
11.1	33.936	24.79	59.922	28.64	52.405	72.19
21.1	34.315	28.20	60.246	31.98	52.678	70.72
31.1	34.622	31.84	60.513	35.48	52.912	69.52
Feb. 10.1	34.852	35.61	60.718	39.07	53.099	68.61
20.0	35.004	39.41	60.859	42.63	53.239	68.00
Mar. 2.0	35.077	43.15	60.937	46.10	53.332	67.66
11.9	35.078	46.76	60.955	49.38	53.377	67.58
21.9	35.009	50.16	60.918	52.44	53.381	67.72
31.9	34.879	53.28	60.833	55.21	53.349	68.03
Apr. 10.9	34.695	56.05	60.709	57.64	53.287	68.48
20.9	34.468	58.45	60.550	59.70	53.203	69.03
30.8	34.208	60.39	60.365	61.34	53.103	69.64
May 10.8	33.922	61.90	60.163	62.55	52.993	70.27
20.8	33.618	62.92	59.949	63.31	52.881	70.89
30.8	33.306	63.43	59.730	63.61	52.770	71.49
June 9.7	32.995	63.44	59.513	63.46	52.665	72.03
19.7	32.693	62.93	59.303	62.85	52.569	72.51
29.7	32.408	61.97	59.106	61.81	52.484	72.92
July 9.7	32.145	60.55	58.928	60.38	52.415	73.23
19.6	31.914	58.72	58.774	58.60	52.363	73.43
29.6	31.724	56.51	58.650	56.52	52.330	73.52
Aug. 8.6	31.584	54.05	58.563	54.21	52.319	73.47
18.5	31.500	51.36	58.517	51.75	52.331	73.26
28.5	31.477	48.58	58.517	49.22	52.368	72.88
Sept. 7.5	31.525	45.81	58.569	46.72	52.435	72.32
17.5	31.644	43.14	58.675	44.36	52.533	71.54
27.4	31.840	40.67	58.838	42.23	52.664	70.55
Oct. 7.4	32.107	38.52	59.060	40.42	52.830	69.34
17.4	32.446	36.77	59.336	39.03	53.032	67.90
27.4	32.850	35.54	59.665	38.13	53.269	66.26
Nov. 6.3	33.309	34.87	60.039	37.77	53.539	64.44
16.3	33.811	34.81	60.449	38.00	53.837	62.47
26.3	34.340	35.38	60.883	38.83	54.158	60.40
Dec. 6.2	34.883	36.58	61.329	40.23	54.492	58.30
16.2	35.418	38.37	61.773	42.18	54.831	56.23
26.2	35.931	40.71	62.199	44.62	55.165	54.25
36.2	36.400	43.52	62.595	47.46	55.482	52.43
Mean Place	32.012	32.36	58.136	34.15	50.475	82.87
Sec δ , Tan δ	1.961	-1.687	1.527	-1.153	1.018	+0.192
a, a'	+2.3	-18.9	+2.6	-19.0	+3.2	-19.0
b, b'	+0.11	-0.3	+0.07	-0.3	-0.01	-0.3
Authority and Catalogue No.	A.E.	658	B.J.	660	B.J.	662

APPARENT PLACES OF STARS, 1935

429

AT UPPER TRANSIT AT GREENWICH

Name	♌ Hydræ		♋ Antliæ		♌ Leonis	
	3.32	Ko	4.70	Ko	5.05	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 10 ^m 46	[°] —15 ['] 51	^h 10 ^m 53	[°] —36 ['] 47	^h 10 ^m 57	[°] + 3 ['] 57
Jan. 1.2	26.373	11.35	42.383	10.52	13.717	53.85
11.1	26.674	13.91	42.720	13.43	14.023	51.88
21.1	26.941	16.46	43.019	16.53	14.299	50.08
31.1	27.168	18.94	43.271	19.73	14.536	48.49
Feb. 10.1	27.349	21.29	43.471	22.93	14.730	47.16
20.0	27.483	23.46	43.618	26.07	14.878	46.11
Mar. 2.0	27.570	25.40	43.712	29.08	14.979	45.35
11.9	27.611	27.10	43.754	31.89	15.036	44.82
21.9	27.612	28.54	43.750	34.46	15.051	44.56
31.9	27.578	29.72	43.705	36.74	15.031	44.51
Apr. 10.9	27.515	30.63	43.626	38.70	14.981	44.62
20.9	27.430	31.27	43.518	40.33	14.909	44.88
30.8	27.329	31.65	43.389	41.50	14.818	45.26
May 10.8	27.218	31.79	43.246	42.48	14.718	45.72
20.8	27.103	31.69	43.093	42.99	14.613	46.24
30.8	26.987	31.37	42.937	43.11	14.508	46.80
June 9.7	26.876	30.84	42.781	42.85	14.406	47.37
19.7	26.773	30.12	42.631	42.22	14.311	47.95
29.7	26.680	29.22	42.491	41.26	14.224	48.51
July 9.7	26.601	28.18	42.364	39.98	14.152	49.04
19.6	26.537	27.04	42.255	38.42	14.094	49.52
29.6	26.492	25.82	42.169	36.63	14.051	49.91
Aug. 8.6	26.469	24.57	42.109	34.67	14.031	50.22
18.5	26.471	23.34	42.080	32.62	14.030	50.38
28.5	26.500	22.20	42.087	30.54	14.057	50.39
Sept. 7.5	26.561	21.21	42.133	28.52	14.110	50.24
17.5	26.655	20.40	42.222	26.65	14.195	49.86
27.4	26.785	19.85	42.356	25.01	14.314	49.27
Oct. 7.4	26.953	19.60	42.538	23.68	14.467	48.43
17.4	27.159	19.70	42.766	22.75	14.658	47.31
27.4	27.402	20.18	43.039	22.27	14.885	45.95
Nov. 6.3	27.678	21.04	43.352	22.29	15.144	44.36
16.3	27.983	22.28	43.699	22.83	15.435	42.54
26.3	28.309	23.89	44.070	23.88	15.749	40.58
Dec. 6.2	28.647	25.82	44.455	25.44	16.079	38.48
16.2	28.988	28.01	44.842	27.46	16.414	36.32
26.2	29.322	30.39	45.219	29.87	16.747	34.18
36.2	29.637	32.90	45.574	32.61	17.063	32.15
Mean Place	24.933	10.78	41.040	16.05	12.214	61.01
Sec δ, Tan δ	1.040	— 0.284	1.249	— 0.748	1.002	+ 0.069
a, a'	+3.0	—19.0	+2.8	—19.2	+3.1	—19.3
b, b'	+0.02	— 0.3	+0.05	— 0.3	0.00	— 0.3
Authority and Catalogue No.	A.N.	663	A.N.	668	A.E.	672

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	β Ursæ Majoris		α Ursæ Majoris (<i>Dubhe</i>)		χ Leonis	
	2.44	Ao	1.95	Ko	4.66	Fo
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	$^{\text{h}} \text{ } ^{\text{m}} \text{ } ^{\text{s}}$ 10 57	$^{\circ} \text{ } ' \text{ } ''$ +56 43	$^{\text{h}} \text{ } ^{\text{m}} \text{ } ^{\text{s}}$ 10 59	$^{\circ} \text{ } ' \text{ } ''$ +62 05	$^{\text{h}} \text{ } ^{\text{m}} \text{ } ^{\text{s}}$ 11 01	$^{\circ} \text{ } ' \text{ } ''$ +7 40
Jan. 1.2	58.435 ⁴⁸⁴	32.05 ¹	46.78	46.77 ¹⁷	41.369 ³¹⁰	67.53 ¹⁸⁷
11.2	58.919 ⁴³⁹	32.04 ⁵⁴	47.33 ⁵⁵	46.94 ⁷³	41.679 ²⁸⁰	65.66 ¹⁶⁶
21.1	59.358 ³⁷⁸	32.58 ¹⁰⁴	47.83 ⁴³	47.67 ¹²⁵	41.959 ²⁴²	64.00 ¹⁴⁰
31.1	59.736 ³⁰⁷	33.62 ¹⁵¹	48.26 ³⁴	48.92 ¹⁷²	42.201 ²⁰⁰	62.60 ¹¹³
Feb. 10.1	60.043 ²²⁸	35.13 ¹⁸⁸	48.60 ²⁶	50.64 ²¹⁰	42.401 ¹⁵³	61.47 ⁸³
20.0	60.271 ¹⁴⁶	37.01 ²¹⁸	48.86 ¹⁶	52.74 ²³⁸	42.554 ¹⁰⁶	60.64 ⁵⁶
Mar. 2.0	60.417 ⁶³	39.19 ²³⁶	49.02 ⁷	55.12 ²⁵⁵	42.660 ⁶¹	60.08 ²⁹
11.9	60.480 ¹⁵	41.55 ²⁴³	49.09 ²	57.67 ²⁶¹	42.721 ²⁰	59.79 ⁵
21.9	60.465 ⁸⁶	43.98 ²⁴¹	49.07 ¹¹	60.28 ²⁵⁷	42.741 ¹⁸	59.74 ¹⁵
31.9	60.379 ¹⁴⁸	46.39 ²²⁹	48.96 ¹⁹	62.85 ²⁴⁰	42.723 ⁴⁷	59.89 ³²
Apr. 10.9	60.231 ¹⁹⁷	48.68 ²⁰⁶	48.77 ²⁴	65.25 ²¹⁵	42.676 ⁷²	60.21 ⁴⁴
20.9	60.034 ²³⁶	50.74 ¹⁷⁶	48.53 ²⁹	67.40 ¹⁸²	42.604 ⁸⁹	60.65 ⁵²
30.9	59.798 ²⁶²	52.50 ¹³⁹	48.24 ³²	69.22 ¹⁴³	42.515 ¹⁰⁰	61.17 ⁵⁸
May 10.8	59.536 ²⁷⁵	53.89 ¹⁰⁰	47.92 ³⁴	70.65 ⁹⁸	42.415 ¹⁰⁶	61.75 ⁶⁰
20.8	59.261 ²⁷⁹	54.89 ⁵⁶	47.58 ³⁵	71.63 ⁵¹	42.309 ¹⁰⁷	62.35 ⁶¹
30.8	58.982 ²⁷²	55.45 ¹¹	47.23 ³⁴	72.14 ⁴	42.202 ¹⁰⁴	62.96 ⁵⁸
June 9.7	58.710 ²⁵⁷	55.56 ³⁴	46.89 ³²	72.18 ⁴⁵	42.098 ⁹⁸	63.54 ⁵⁵
19.7	58.453 ²³⁶	55.22 ⁷⁸	46.57 ³⁰	71.73 ⁹²	42.000 ⁸⁸	64.09 ⁵¹
29.7	58.217 ²⁰⁶	54.44 ¹²⁰	46.27 ²⁷	70.81 ¹³⁶	41.912 ⁷⁶	64.60 ⁴²
July 9.7	58.011 ¹⁷¹	53.24 ¹⁶⁰	46.00 ²²	69.45 ¹⁷⁸	41.836 ⁶²	65.02 ³⁴
19.6	57.840 ¹³³	51.64 ¹⁹⁵	45.78 ¹⁷	67.67 ²¹⁶	41.774 ⁴⁵	65.36 ²³
29.6	57.707 ⁹¹	49.69 ²²⁹	45.61 ¹²	65.51 ²⁴⁹	41.729 ²⁵	65.59 ¹¹
Aug. 8.6	57.616 ⁴⁵	47.40 ²⁵⁶	45.49 ⁷	63.02 ²⁷⁸	41.704 ⁴	65.70 ³
18.6	57.571 ⁴	44.84 ²⁸⁰	45.42 ²	60.24 ³⁰¹	41.700 ²¹	65.67 ²⁰
28.5	57.575 ⁵⁷	42.04 ²⁹⁹	45.40 ⁵	57.23 ³¹⁹	41.721 ⁴⁹	65.47 ³⁸
Sept. 7.5	57.632 ¹¹¹	39.05 ³¹³	45.45 ¹²	54.04 ³³²	41.770 ⁸⁰	65.09 ⁶⁰
17.5	57.743 ¹⁶⁸	35.92 ³²⁰	45.57 ¹⁸	50.72 ³³⁷	41.850 ¹¹⁴	64.49 ⁸²
27.4	57.911 ²²⁷	32.72 ³²¹	45.75 ²⁵	47.35 ³³⁷	41.964 ¹⁵⁰	63.67 ¹⁰⁵
Oct. 7.4	58.138 ²⁸⁵	29.51 ³¹⁷	46.00 ³²	43.98 ³³⁰	42.114 ¹⁸⁶	62.62 ¹³⁰
17.4	58.423 ³⁴³	26.34 ³⁰⁶	46.32 ³⁸	40.68 ³¹⁴	42.300 ²²³	61.32 ¹⁵³
27.4	58.766 ³⁹⁵	23.28 ²⁸⁷	46.70 ⁴⁵	37.54 ²⁹²	42.523 ²⁵⁸	59.79 ¹⁷⁴
Nov. 6.3	59.161 ⁴⁴⁴	20.41 ²⁶¹	47.15 ⁵⁰	34.62 ²⁶³	42.781 ²⁸⁸	58.05 ¹⁹²
16.3	59.605 ⁴⁸²	17.80 ²²⁶	47.65 ⁵⁴	31.99 ²²⁴	43.069 ³¹³	56.13 ²⁰⁴
26.3	60.087 ⁵⁰⁹	15.54 ¹⁸⁶	48.19 ⁵⁸	29.75 ¹⁸⁰	43.382 ³²⁹	54.09 ²¹³
Dec. 6.3	60.596 ⁵²²	13.68 ¹³⁹	48.77 ⁵⁹	27.95 ¹³⁰	43.711 ³³⁷	51.96 ²¹⁴
16.2	61.118 ⁵²⁰	12.29 ⁸⁸	49.36 ⁵⁹	26.65 ⁷⁵	44.048 ³³⁴	49.82 ²⁰⁸
26.2	61.638 ⁵⁰⁰	11.41 ³⁴	49.95 ⁵⁷	25.90 ¹⁸	44.382 ³²⁰	47.74 ¹⁹⁶
36.2	62.138	11.07	50.52	25.72	44.702	45.78
Mean Place	55.905	52.84	43.948	68.44	39.861	76.01
Sec δ , Tan δ	1.823	+1.524	2.137	+1.889	1.009	+0.135
α, α'	+3.6	-19.3	+3.7	-19.4	+3.1	-19.4
δ, δ'	-0.10	-0.3	-0.12	-0.3	-0.01	-0.3
Authority and Catalogue No.	B.J.	674	B.J.	675	B.J.	677

APPARENT PLACES OF STARS, 1935

431

AT UPPER TRANSIT AT GREENWICH

Name	ψ Ursæ Majoris		β Crateris		δ Leonis	
	3.15	Ko	4.52	A2	2.58	A3
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 11 00	[°] ['] +44 50	^h ^m 11 08	[°] ['] -22 28	^h ^m 11 10	[°] ['] +20 52
Jan. 1.2	02.980	46.61	28.758	12.95	40.791	35.59
11.2	03.382	46.07	29.078	15.59	41.120	34.13
21.1	03.747	46.03	29.367	18.29	41.421	33.00
31.1	04.066	46.46	29.616	21.00	41.684	32.22
Feb. 10.1	04.329	47.35	29.822	23.63	41.904	31.79
20.0	04.531	48.63	29.979	26.13	42.075	31.72
Mar. 2.0	04.667	50.23	30.089	28.45	42.196	31.96
11.9	04.739	52.07	30.154	30.54	42.269	32.47
21.9	04.752	54.04	30.176	32.39	42.297	33.21
31.9	04.709	56.07	30.162	33.97	42.285	34.10
Apr. 10.9	04.618	58.05	30.116	35.28	42.239	35.10
20.9	04.490	59.90	30.044	36.31	42.166	36.14
30.9	04.333	61.56	29.953	37.05	42.072	37.17
May 10.8	04.155	62.95	29.849	37.51	41.964	38.14
20.8	03.967	64.03	29.735	37.68	41.849	39.02
30.8	03.776	64.77	29.618	37.59	41.731	39.76
June 9.7	03.588	65.15	29.500	37.23	41.615	40.36
19.7	03.410	65.15	29.386	36.62	41.505	40.79
29.7	03.246	64.78	29.277	35.79	41.403	41.04
July 9.7	03.103	64.04	29.179	34.75	41.315	41.10
19.6	02.983	62.96	29.094	33.54	41.242	40.96
29.6	02.889	61.54	29.026	32.20	41.186	40.63
Aug. 8.6	02.825	59.82	28.978	30.78	41.150	40.08
18.6	02.795	57.82	28.954	29.32	41.137	39.33
28.5	02.800	55.57	28.958	27.90	41.149	38.37
Sept. 7.5	02.844	53.10	28.994	26.58	41.191	37.20
17.5	02.931	50.46	29.066	25.41	41.264	35.81
27.4	03.062	47.68	29.176	24.48	41.373	34.23
Oct. 7.4	03.239	44.82	29.327	23.84	41.519	32.44
17.4	03.464	41.92	29.520	23.54	41.704	30.48
27.4	03.737	39.04	29.753	23.64	41.927	28.37
Nov. 6.3	04.054	36.25	30.025	24.14	42.188	26.16
16.3	04.411	33.62	30.329	25.08	42.481	23.88
26.3	04.802	31.22	30.659	26.42	42.802	21.60
Dec. 6.3	05.217	29.13	31.006	28.15	43.144	19.39
16.2	05.644	27.40	31.359	30.22	43.494	17.31
26.2	06.071	26.10	31.708	32.55	43.845	15.42
36.2	06.484	25.28	32.041	35.08	44.184	13.79
Mean Place	00.962	65.60	27.457	14.14	39.212	48.48
Sec δ , Tan δ	1.411	+ 0.995	1.082	- 0.414	1.070	+ 0.381
a, a'	+3.4	-19.5	+2.9	-19.5	+3.2	-19.6
b, b'	-0.06	- 0.2	+0.03	- 0.2	-0.02	- 0.2
Authority and Catalogue No.	B.J.	680	B.J.	682	B.J.	683

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	θ Leonis		δ Crateris		τ Leonis	
	3.41	Ao	3.82	Ko	5.18	Ko
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
Mean Solar Date	II 10	+15 46	II 16	-14 25	II 24	+ 3 12
Jan. 1.2	51.346 ³²²	55.26 ¹⁶³	06.600 ³¹⁷	36.90 ²⁴⁶	36.986 ³¹⁸	44.38 ²⁰⁴
11.2	51.668 ²⁹³	53.63 ¹³⁵	06.917 ²⁸⁷	39.36 ²⁴⁶	37.304 ²⁹²	42.34 ¹⁸⁸
21.1	51.961 ²⁵⁷	52.28 ¹⁰³	07.204 ²⁵²	41.82 ²³⁸	37.596 ²⁵⁵	40.46 ¹⁶⁶
31.1	52.218 ²¹⁴	51.25 ⁷⁰	07.456 ²⁰⁹	44.20 ²²⁶	37.851 ²¹⁷	38.80 ¹³⁰
Feb. 10.1	52.432 ¹⁶⁷	50.55 ³⁸	07.665 ¹⁶³	46.46 ²⁰⁹	38.068 ¹⁷⁴	37.41 ¹¹²
20.1	52.599 ¹¹⁹	50.17 ⁷	07.828 ¹¹⁸	48.55 ¹⁸⁷	38.242 ¹²⁷	36.29 ⁸⁵
Mar. 2.0	52.718 ⁷²	50.10 ²¹	07.946 ⁷⁴	50.42 ¹⁶⁴	38.369 ⁸⁰	35.44 ⁵⁷
12.0	52.790 ²⁹	50.31 ⁴⁴	08.020 ³³	52.06 ¹³⁸	38.455 ⁴²	34.87 ³³
21.9	52.819 ¹¹	50.75 ⁶¹	08.053 ⁴	53.44 ¹¹³	38.497 ⁹	34.54 ¹⁰
31.9	52.808 ⁴²	51.36 ⁷⁵	08.049 ³⁴	54.57 ⁸⁸	38.506 ²⁷	34.44 ¹⁰
Apr. 10.9	52.766 ⁶⁹	52.11 ⁸²	08.015 ⁶⁰	55.45 ⁶⁴	38.479 ⁵⁰	34.54 ²⁴
20.9	52.697 ⁸⁹	52.93 ⁸⁵	07.955 ⁷⁹	56.09 ³⁹	38.429 ⁷¹	34.78 ³⁰
30.9	52.608 ¹⁰¹	53.78 ⁸⁴	07.876 ⁹²	56.48 ¹⁷	38.358 ⁸³	35.17 ⁴⁵
May 10.8	52.507 ¹⁰⁹	54.62 ⁷⁹	07.784 ¹⁰¹	56.65 ⁴	38.275 ⁹⁵	35.62 ⁵⁵
20.8	52.398 ¹¹²	55.41 ⁷¹	07.683 ¹⁰⁶	56.61 ²⁵	38.180 ⁹⁸	36.17 ⁵⁹
30.8	52.286 ¹⁰⁹	56.12 ⁶¹	07.577 ¹⁰⁷	56.36 ⁴⁴	38.082 ¹⁰⁰	36.76 ⁶⁰
June 9.8	52.177 ¹⁰⁴	56.73 ⁴⁹	07.470 ¹⁰⁴	55.92 ⁶¹	37.982 ⁹⁷	37.36 ⁶⁰
19.7	52.073 ⁹⁶	57.22 ³⁴	07.366 ⁹⁸	55.31 ⁷⁷	37.885 ⁹²	37.06 ⁶⁰
29.7	51.977 ⁸⁴	57.56 ²¹	07.268 ⁹⁰	54.54 ⁹⁰	37.793 ⁸⁶	38.56 ⁵⁴
July 9.7	51.893 ⁷⁰	57.77 ⁶	07.178 ⁷⁸	53.64 ¹⁰⁰	37.707 ⁷⁴	39.10 ⁵¹
19.6	51.823 ⁵³	57.83 ¹¹	07.100 ⁶⁴	52.64 ¹⁰⁷	37.633 ⁵⁹	39.61 ⁴¹
29.6	51.770 ³⁵	57.72 ²⁹	07.036 ⁴⁵	51.57 ¹⁰⁹	37.574 ⁴³	40.02 ³³
Aug. 8.6	51.735 ¹²	57.43 ⁴⁷	06.991 ²⁴	50.48 ¹⁰⁸	37.531 ²⁴	40.35 ¹⁷
18.6	51.723 ¹³	56.96 ⁶⁷	06.967 ²	49.40 ¹⁰²	37.507 [—]	40.52 ⁵
28.5	51.736 ⁴¹	56.29 ⁸⁷	06.969 ³¹	48.38 ⁹⁰	37.507 ²⁶	40.57 ¹²
Sept. 7.5	51.777 ⁷²	55.42 ¹⁰⁹	07.000 ⁶⁴	47.48 ⁷²	37.533 ⁵⁸	40.45 ³⁴
17.5	51.849 ¹⁰⁷	54.33 ¹³⁰	07.064 ¹⁰⁰	46.76 ⁴⁹	37.511 ⁹¹	40.11 ⁵⁷
27.5	51.956 ¹⁴³	53.03 ¹⁵¹	07.164 ¹³⁹	46.27 ²²	37.682 ¹²⁸	39.54 ⁸¹
Oct. 7.4	52.099 ¹⁸¹	51.52 ¹⁷¹	07.303 ¹⁷⁹	46.05 ¹¹	37.810 ¹⁶⁸	38.73 ¹⁰⁶
17.4	52.280 ²¹⁹	49.81 ¹⁹⁰	07.482 ²¹⁹	46.16 ⁴⁵	37.978 ²⁰⁰	37.07 ¹³⁴
27.4	52.499 ²⁵⁵	47.91 ²⁰⁴	07.701 ²⁵⁶	46.61 ⁸¹	38.184 ²⁴¹	36.33 ¹⁵⁷
Nov. 6.3	52.754 ²⁸⁹	45.87 ²¹⁵	07.957 ²⁸⁹	47.42 ¹¹⁹	38.425 ²⁷⁴	34.76 ¹⁸⁰
16.3	53.043 ³¹⁵	43.72 ²²¹	08.246 ³¹⁶	48.61 ¹⁵²	38.690 ³⁰³	32.96 ¹⁹⁷
26.3	53.358 ³³⁴	41.51 ²¹⁹	08.562 ³³⁴	50.13 ¹⁸³	39.002 ³²⁵	30.90 ²¹¹
Dec. 6.3	53.692 ³⁴⁴	39.32 ²¹²	08.896 ³⁴³	51.96 ²⁰⁹	39.327 ³³⁴	28.88 ²¹⁷
16.2	54.036 ³⁴³	37.20 ¹⁹⁸	09.239 ³⁴⁰	54.05 ²²⁹	39.661 ³³⁶	26.71 ²¹⁷
26.2	54.379 ³³¹	35.22 ¹⁷⁷	09.579 ³²⁷	56.34 ²³⁹	39.997 ³²⁵	24.54 ²¹⁰
36.2	54.710	33.45	09.906	58.73	40.322	22.44
Mean Place	49.820	66.60	05.307	35.39	35.610	52.02
Sec δ , Tan δ	1.039	+ 0.283	1.033	- 0.257	1.002	+ 0.056
a, a'	+3.2	-19.6	+3.0	-19.7	+3.1	-19.8
b, b'	-0.02	- 0.2	+0.02	- 0.2	0.00	- 0.2
Authority and Catalogue No.	B.J.	684	B.J.	690	A.E.	697

§ Transit, Mar. 11

† First transit, Mar. 12

APPARENT PLACES OF STARS, 1935

433

AT UPPER TRANSIT AT GREENWICH

Name	λ Draconis		ξ Hydræ		λ Centauri	
	4.06	Ma	3.72	G5	3.34	B9
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 11 27	+69° 40'	^h ^m 11 29	-31° 29'	^h ^m 11 32	-62° 39'
Jan. 1.2	37.06	60.30	49.132	47.95	47.48	24.41
11.2	37.79	60.37	49.481	50.58	48.03	26.95
21.1	38.46	61.05	49.799	53.39	48.52	29.91
31.1	39.05	62.31	50.079	56.28	48.95	33.21
Feb. 10.1	39.55	64.09	50.313	59.20	49.30	36.75
20.1	39.94	66.30	50.500	62.06	49.58	40.44
Mar. 2.0	40.21	68.85	50.638	64.80	49.78	44.18
12.0	40.35	71.61	50.728	67.36	49.89	47.89
21.9	40.37	74.48	50.773	69.72	49.93	51.49
31.9	40.27	77.32	50.778	71.82	49.90	54.91
Apr. 10.9	40.07	80.03	50.747	73.65	49.80	58.08
20.9	39.77	82.49	50.688	75.18	49.64	60.94
30.9	39.39	84.62	50.604	76.40	49.43	63.44
May 10.8	38.96	86.35	50.501	77.30	49.18	65.53
20.8	38.48	87.61	50.385	77.88	48.90	67.18
30.8	37.99	88.38	50.259	78.13	48.59	68.35
June 9.8	37.49	88.63	50.127	78.05	48.26	69.03
19.7	37.00	88.35	49.995	77.65	47.92	69.21
29.7	36.53	87.54	49.864	76.95	47.58	68.86
July 9.7	36.10	86.25	49.740	75.97	47.25	68.03
19.7	35.71	84.49	49.627	74.73	46.95	66.74
29.6	35.37	82.29	49.529	73.28	46.67	65.02
Aug. 8.6	35.10	79.72	49.450	71.67	46.43	62.92
18.6	34.90	76.81	49.395	69.95	46.25	60.52
28.5	34.78	73.63	49.369	68.19	46.13	57.90
Sept. 7.5	34.74	70.23	49.378	66.46	46.07	55.15
17.5	34.78	66.68	49.425	64.83	46.10	52.37
27.5	34.92	63.05	49.515	63.40	46.21	49.68
Oct. 7.4	35.15	59.40	49.651	62.22	46.41	47.18
17.4	35.48	55.83	49.834	61.38	46.69	44.98
27.4	35.89	52.40	50.064	60.93	47.06	43.19
Nov. 6.4	36.39	49.19	50.337	60.92	47.51	41.88
16.3	36.98	46.30	50.649	61.37	48.02	41.14
26.3	37.64	43.81	50.991	62.30	48.58	40.99
Dec. 6.3	38.34	41.78	51.356	63.67	49.17	41.46
16.2	39.08	40.28	51.730	65.47	49.77	42.55
26.2	39.84	39.37	52.104	67.64	50.37	44.24
36.2	40.58	39.07	52.464	70.11	50.94	46.46
Mean Place	34.064	84.29	47.980	51.72	46.417	35.89
Secδ, Tanδ	2.881	+ 2.702	1.173	- 0.613	2.177	- 1.934
a, a'	+3.6	-19.8	+3.0	-19.9	+2.8	-19.9
b, b'	-0.18	- 0.1	+0.04	- 0.1	+0.13	- 0.1
Authority and Catalogue No.	B.J.	701	B.J.	702	B.J.	704

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ν Leonis		ν Virginis		β Leonis (<i>Denebola</i>)	
	4.47	Ko	4.20	Ma	2.23	Λ 2
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 11 ^m 33	[°] 0 ['] 27	^h 11 ^m 42	[°] + 6 ['] 53	^h 11 ^m 45	[°] + 14 ['] 55
Jan. 1-2	38.445 ³²⁰	59.47 ²¹⁴	32.334 ³²⁵	28.03 ¹⁹⁹	45.989 ³³³	55.56 ¹⁸¹
11-2	38.765 ²⁹⁶	61.61 ²⁰¹	32.659 ³⁰³	26.04 ¹⁷⁸	46.322 ³¹⁰	53.75 ¹⁵²
21-2	39.061 ²⁶³	63.62 ¹⁸³	32.962 ²⁷²	24.26 ¹⁵⁵	46.632 ²⁷⁹	52.23 ¹²⁰
31-1	39.324 ²²⁴	65.45 ¹⁶⁰	33.234 ²³⁴	22.71 ¹²⁵	46.911 ²⁴⁰	51.03 ⁸⁵
Feb. 10-1	39.548 ¹⁸¹	67.05 ¹³⁴	33.468 ¹⁹¹	21.46 ⁹⁵	47.151 ¹⁹⁸	50.18 ⁵¹
20-1	39.729	68.39 ¹⁰⁷	33.659 ¹⁴⁸	20.51 ⁶⁵	47.349 ¹⁵²	49.67 ¹⁸
Mar. 2-0	39.866 ⁹³	69.46 ⁸⁰	33.807 ¹⁰³	19.86 ³⁶	47.501 ¹⁰⁷	49.49 ¹³
12-0	39.959 ⁵²	70.26 ⁵⁵	33.910 ⁶¹	19.50 ¹⁰	47.608 ⁶⁴	49.62 ³⁹
21-9	40.011 ¹⁶	70.81 ³¹	33.971 ²⁴	19.40 ¹²	47.672 ²⁴	50.01 ⁶¹
31-9	40.027 ¹⁶	71.12 ¹¹	33.995 ⁹	19.52 ³²	47.696 ¹⁰	50.62 ⁷⁷
Apr. 10-9	40.011 ⁴³	71.23 ⁸	33.986 ³⁸	19.84 ⁴⁶	47.686 ⁴⁰	51.39 ⁸⁴
20-9	39.968 ⁶³	71.15 ²³	33.948 ⁵⁸	20.30 ⁵⁷	47.646 ⁶³	52.27 ⁹³
30-9	39.905 ⁷⁸	70.92 ³⁴	33.890 ⁷⁶	20.87 ⁶⁴	47.583 ⁸⁰	53.20 ⁹³
May 10-9	39.827 ⁸⁸	70.58 ⁴⁵	33.814 ⁸⁷	21.51 ⁶⁷	47.503 ⁹⁴	54.13 ⁹¹
20-8	39.739 ⁹⁵	70.13 ⁵²	33.727 ⁹⁵	22.18 ⁶⁸	47.409 ¹⁰¹	55.04 ⁸⁴
30-8	39.644 ⁹⁸	69.61 ⁵⁷	33.632 ⁹⁹	22.86 ⁶⁶	47.308 ¹⁰⁶	55.88 ⁷⁴
June 9-8	39.546 ⁹⁷	69.04 ⁶¹	33.533 ⁹⁸	23.52 ⁶²	47.202 ¹⁰⁶	56.62 ⁶²
19-7	39.449 ⁹⁴	68.43 ⁶⁴	33.435 ⁹⁷	24.14 ⁵⁶	47.096 ¹⁰⁴	57.24 ⁴⁹
29-7	39.355 ⁸⁷	67.79 ⁶²	33.338 ⁹¹	24.70 ⁴⁸	46.992 ⁹⁸	57.73 ³³
July 9-7	39.268 ⁷⁸	67.17 ⁵⁹	33.247 ⁸²	25.18 ³⁹	46.894 ⁸⁹	58.06 ¹⁷
19-7	39.190 ⁶⁶	66.58 ⁵⁵	33.165 ⁷¹	25.57 ²⁸	46.805 ⁷⁷	58.23 ¹
29-6	39.124 ⁵⁰	66.03 ⁴⁸	33.094 ⁵⁶	25.85 ¹⁶	46.728 ⁶³	58.22 ¹⁹
Aug. 8-6	39.074 ³²	65.55 ³⁸	33.038 ³⁹	26.01 [—]	46.665 ⁴⁴	58.03 ³⁹
18-6	39.042 ⁹	65.17 ²⁵	32.999 ¹⁶	26.01 ¹⁶	46.621 ²²	57.64 ⁶⁰
28-6	39.033 ¹⁷	64.92 ⁹	32.983 ⁹	25.85 ³⁶	46.599 ⁴	57.04 ⁸¹
Sept. 7-5	39.050 ⁴⁸	64.83 ¹¹	32.992 ³⁹	25.49 ⁵⁶	46.603 ³⁴	56.23 ¹⁰⁴
17-5	39.098 ⁸²	64.94 ³⁴	33.031 ⁷²	24.93 ⁷⁸	46.637 ⁶⁸	55.19 ¹²⁶
27-5	39.180 ¹¹⁹	65.28 ⁵⁹	33.103 ¹¹⁰	24.15 ¹⁰³	46.705 ¹⁰⁶	53.93 ¹⁴⁹
Oct. 7-4	39.299 ¹⁵⁸	65.87 ⁸⁶	33.213 ¹⁴⁹	23.12 ¹²⁷	46.811 ¹⁴⁵	52.44 ¹⁷¹
17-4	39.457 ¹⁹⁸	66.73 ¹¹³	33.362 ¹⁸⁹	21.85 ¹⁵¹	46.956 ¹⁸⁷	50.73 ¹⁹¹
27-4	39.655 ²³⁵	67.86 ¹⁴¹	33.551 ²²⁸	20.34 ¹⁷⁴	47.143 ²²⁶	48.82 ²⁰⁸
Nov. 6-4	39.890 ²⁷¹	69.27 ¹⁶⁶	33.779 ²⁶⁴	18.60 ¹⁹²	47.369 ²⁶⁴	46.74 ²²¹
16-3	40.161 ³⁰⁰	70.93 ¹⁸⁷	34.043 ²⁹⁴	16.68 ²⁰⁸	47.633 ²⁹⁶	44.53 ²²⁹
26-3	40.461 ³²¹	72.80 ²⁰⁵	34.337 ³¹⁹	14.60 ²¹⁸	47.929 ³²¹	42.24 ²³⁰
Dec. 6-3	40.782 ³³⁴	74.85 ²¹⁶	34.656 ³³³	12.42 ²²¹	48.250 ³³⁷	39.94 ²²⁵
16-3	41.116 ³³⁷	77.01 ²²⁰	34.989 ³³⁹	10.21 ²¹⁷	48.587 ³⁴³	37.69 ²¹²
26-2	41.453 ³²⁷	79.21 ²¹⁷	35.328 ³³¹	08.04 ²⁰⁷	48.930 ³³⁸	35.57 ¹⁹⁴
36-2	41.780	81.38	35.659	05.97	49.268	33.63
Mean Place	37.174	52.88	31.071	37.34	44.690	67.65
Sec δ , Tan δ	1.000	— 0.008	1.007	+ 0.121	1.035	+ 0.267
a, a'	+3.1	—19.9	+3.1	—20.0	+3.1	—20.0
b, b'	0.00	— 0.1	—0.01	— 0.1	—0.02	— 0.1
Authority and Catalogue No.	B.J.	706	N.A.	712	B.J.	717

APPARENT PLACES OF STARS, 1935

435

AT UPPER TRANSIT AT GREENWICH

Name	β Virginis		B Centauri		γ Ursæ Majoris	
Mag. Spect.	3.80	F8	4.7I	Ko	2.54	Ao
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m II 47	^s ['] + 2 07	^h ^m II 47	^s ['] - 44 48	^h ^m II 50	^s ['] + 54 02
Jan. 1.2	19.715 ³²⁶	44.40 ²¹¹	54.236 ⁴⁰⁷	34.76 ²⁵¹	26.996 ⁴⁸¹	59.95 ⁷⁰
11.2	20.041 ³⁰⁵	42.29 ¹⁹⁵	54.643 ³⁷⁵	37.27 ²⁸²	27.477 ⁴⁵³	59.25 ¹²
21.2	20.346 ²⁷⁴	40.34 ¹⁷⁴	55.018 ³³³	40.09 ³⁰⁴	27.930 ⁴¹⁰	59.13 ⁴⁴
31.1	20.620 ²³⁷	38.60 ¹⁴⁹	55.351 ²⁸⁵	43.13 ³¹⁹	28.340 ³⁵⁵	59.57 ⁹⁹
Feb. 10.1	20.857 ¹⁹⁵	37.11 ¹²²	55.636 ²³²	46.32 ³²⁵	28.695 ²⁹¹	60.56 ¹⁴⁶
20.1	21.052 ¹⁵²	35.89 ⁹³	55.868 ¹⁷⁷	49.57 ³²²	28.986 ²¹⁹	62.02 ¹⁸⁷
Mar. 2.0	21.204 ¹⁰⁹	34.96 ⁶⁶	56.045 ¹²²	52.79 ³¹³	29.205 ¹⁴⁶	63.89 ²¹⁸
12.0	21.313 ⁶⁷	34.30 ⁴⁰	56.167 ⁷¹	55.92 ²⁹⁹	29.351 ⁷³	66.07 ²³⁹
21.9	21.380 ³¹	33.90 ¹⁶	56.238 ²²	58.91 ²⁷⁸	29.424 ³	68.46 ²⁵⁰
31.9	21.411 ²	33.74 ⁵	56.260 ²¹	61.69 ²⁵²	29.427 ⁶⁰	70.96 ²⁴⁹
Apr. 10.9	21.409 ³⁰	33.79 ²¹	56.239 ⁵⁹	64.21 ²²³	29.367 ¹¹⁵	73.45 ²³⁸
20.9	21.379 ⁵¹	34.00 ³⁶	56.180 ⁹¹	66.44 ¹⁹⁰	29.252 ¹⁶⁰	75.83 ²¹⁸
30.9	21.328 ⁶⁹	34.36 ⁴⁵	56.089 ¹¹⁸	68.34 ¹⁵⁵	29.092 ¹⁹⁷	78.01 ¹⁹⁰
May 10.9	21.259 ⁸¹	34.81 ⁵⁴	55.971 ¹³⁹	69.89 ¹¹⁷	28.895 ²²⁴	79.91 ¹⁵⁶
20.8	21.178 ⁸⁹	35.35 ⁵⁸	55.832 ¹⁵⁷	71.06 ⁷⁸	28.671 ²⁴⁰	81.47 ¹¹⁷
30.8	21.089 ⁹⁴	35.93 ⁶⁰	55.675 ¹⁶⁹	71.84 ³⁸	28.431 ²⁵⁰	82.64 ⁷⁴
June 9.8	20.995 ⁹⁵	36.53 ⁶¹	55.506 ¹⁷⁶	72.22 ⁴	28.181 ²⁵⁰	83.38 ³⁰
19.7	20.900 ⁹⁴	37.14 ⁶¹	55.330 ¹⁷⁸	72.18 ⁴⁴	27.931 ²⁴⁵	83.68 ¹⁵
29.7	20.806 ⁸⁹	37.75 ⁵⁷	55.152 ¹⁷⁵	71.74 ⁸²	27.686 ²²⁹	83.53 ⁶⁰
July 9.7	20.717 ⁸²	38.32 ⁵²	54.977 ¹⁶⁶	70.92 ¹¹⁸	27.457 ²¹²	82.93 ¹⁰⁴
19.7	20.635 ⁷²	38.84 ⁴⁴	54.811 ¹⁵¹	69.74 ¹⁵¹	27.245 ¹⁸⁷	81.89 ¹⁴⁵
29.6	20.563 ⁵⁹	39.28 ³⁶	54.660 ¹³¹	68.23 ¹⁷⁹	27.058 ¹⁵⁸	80.44 ¹⁸⁵
Aug. 8.6	20.504 ⁴¹	39.64 ²³	54.529 ¹⁰³	66.44 ²⁰¹	26.900 ¹²³	78.59 ²²⁰
18.6	20.463 ²⁰	39.87 ¹⁰	54.426 ⁶⁸	64.43 ²¹⁴	26.777 ⁸⁴	76.39 ²⁵²
28.6	20.443 ⁶	39.97 ⁷	54.358 ²⁷	62.29 ²²²	26.693 ³⁹	73.87 ²⁷⁹
Sept. 7.5	20.449 ³⁵	39.90 ²⁸	54.331 ²¹	60.07 ²¹⁹	26.654 ¹⁰	71.08 ³⁰²
17.5	20.484 ⁷⁰	39.62 ⁵⁰	54.352 ⁷³	57.88 ²⁰⁸	26.664 ⁶³	68.06 ³¹⁹
27.5	20.554 ¹⁰⁶	39.12 ⁷⁵	54.425 ¹²⁹	55.80 ¹⁸⁷	26.727 ¹²¹	64.87 ³³¹
Oct. 7.4	20.660 ¹⁴⁶	38.37 ¹⁰⁰	54.554 ¹⁸⁸	53.93 ¹⁵⁷	26.848 ¹⁸⁰	61.56 ³³⁶
17.4	20.806 ¹⁸⁷	37.37 ¹²⁷	54.742 ²⁴⁵	52.36 ¹¹⁹	27.028 ²⁴¹	58.20 ³³⁵
27.4	20.993 ²²⁶	36.10 ¹⁵²	54.987 ³⁰⁰	51.17 ⁷⁴	27.269 ³⁰⁰	54.85 ³²⁵
Nov. 6.4	21.219 ²⁶³	34.58 ¹⁷⁶	55.287 ³⁴⁷	50.43 ²⁴	27.569 ³⁵⁶	51.60 ³⁰⁸
16.3	21.482 ²⁹⁴	32.82 ¹⁹⁵	55.634 ³⁸⁶	50.19 ²⁹	27.925 ⁴⁰⁶	48.52 ²⁸²
26.3	21.776 ³¹⁸	30.87 ²⁰⁹	56.020 ⁴¹⁴	50.48 ⁸³	28.331 ⁴⁴⁶	45.70 ²⁴⁷
Dec. 6.3	22.094 ³³³	28.78 ²¹⁹	56.434 ⁴²⁹	51.31 ¹³⁵	28.777 ⁴⁷⁴	43.23 ²⁰⁵
16.3	22.427 ³³⁹	26.59 ²²⁰	56.863 ⁴³¹	52.66 ¹⁸⁴	29.251 ⁴⁸⁷	41.18 ¹⁵⁷
26.2	22.766 ³³²	24.39 ²¹⁵	57.294 ⁴²⁰	54.50 ²²⁶	29.738 ⁴⁸⁶	39.61 ¹⁰³
36.2	23.098	22.24	57.714	56.76	30.224	38.58
Mean Place	18.508	52.18	53.244	42.19	25.200	82.68
Sec δ , Tan δ	1.001	+ 0.037	1.410	- 0.993	1.704	+ 1.379
a, a'	+3.1	-20.0	+3.0	-20.0	+3.2	-20.0
b, b'	0.00	- 0.1	+0.07	- 0.1	-0.09	0.0
Authority and Catalogue No.	B.J.	718	A.N.	719	B.J.	722

† Second transit, Mar. 21

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	Mag. Spect.	π Virginis		\circ Virginis		δ Centauri	
		4.57	A3	4.24	G5	2.88	B3p
Mean Solar Date		R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
		^h ^m 11 57	^s + 6 58	^h ^m 12 01	^s + 9 05	^h ^m 12 04	^s -50 21
Jan. 1.2		33.668	26.91	55.020	28.19	59.685	28.75
11.2		33.997	24.90	55.352	26.21	60.137	31.05
21.2		34.307	23.11	55.665	24.45	60.557	33.73
31.1		34.588	21.55	55.949	22.97	60.937	36.69
Feb. 10.1		34.833	20.28	56.198	21.79	61.266	39.86
20.1		35.037	19.31	56.407	20.93	61.540	43.15
Mar. 2.1		35.197	18.65	56.572	20.40	61.756	46.48
12.0		35.317	18.31	56.695	20.17	61.913	49.78
22.0		35.394†	18.21	56.776	20.21	62.014	52.97
31.9		35.430	18.36	56.818	20.49	62.062	55.99
Apr. 10.9		35.437	18.72	56.825	20.96	62.062	58.80
20.9		35.412	19.20	56.804	21.58	62.017	61.34
30.9		35.367	19.80	56.759	22.29	61.934	63.57
May 10.9		35.300	20.49	56.695	23.07	61.817	65.45
20.8		35.223	21.19	56.617	23.86	61.672	66.95
30.8		35.134	21.91	56.528	24.64	61.503	68.05
June 9.8		35.039	22.60	56.432	25.38	61.316	68.74
19.8		34.940	23.26	56.332	26.06	61.116	68.99
29.7		34.842	23.85	56.233	26.65	60.908	68.80
July 9.7		34.748	24.37	56.136	27.13	60.699	68.19
19.7		34.660	24.78	56.044	27.50	60.496	67.17
29.7		34.578	25.09	55.961	27.73	60.305	65.78
Aug. 8.6		34.511	25.24	55.890	27.82	60.135	64.05
18.6		34.460	25.26	55.835	27.74	59.993	62.05
28.6		34.429	25.10	55.800	27.47	59.888	59.85
Sept. 7.5		34.425	24.75	55.790	27.01	59.827	57.51
17.5		34.450	24.19	55.808	26.33	59.810	55.15
27.5		34.507	23.41	55.860	25.42	59.870	52.84
Oct. 7.5		34.601	22.38	55.948	24.27	59.983	50.69
17.4		34.737	21.11	56.078	22.88	60.163	48.80
27.4		34.912	19.60	56.249	21.26	60.408	47.26
Nov. 6.4		35.129	17.84	56.461	19.43	60.715	46.15
16.4		35.382	15.92	56.711	17.41	61.079	45.53
26.3		35.669	13.83	56.996	15.26	61.488	45.44
Dec. 6.3		35.983	11.62	57.307	13.03	61.932	45.90
16.3		36.313	09.40	57.638	10.78	62.397	46.92
26.2		36.651	07.20	57.976	08.59	62.868	48.46
36.2		36.986	05.14	58.312	06.52	63.330	50.48
Mean Place		32.494	36.60	53.861	38.69	58.833	37.44
Secδ, Tanδ		1.007	+ 0.122	1.013	+ 0.160	1.567	- 1.207
α, α'		+3.1	-20.0	+3.1	-20.0	+3.1	-20.0
δ, δ'		-0.01	0.0	-0.01	0.0	+0.08	0.0
Authority and Catalogue No.		A.E.	726	B.J.	730	B.J.	733

† First transit, Mar 22

APPARENT PLACES OF STARS, 1935

437

AT UPPER TRANSIT AT GREENWICH

Name	ε Corvi		δ Crucis		δ Ursæ Majoris	
Mag. Spect.	3.21	Ko	3.08	B3	3.44	A2
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₂ ^m ₀₆	[°] ₂₂ ['] ₁₅	^h ₁₂ ^m ₁₁	[°] ₅₈ ['] ₂₃	^h ₁₂ ^m ₁₂	[°] ₅₇ ['] ₂₂
Jan. 1.2	47.633 ³⁴⁸	29.17 ²³⁶	41.608 ⁵³⁰	03.76 ²¹³	14.570 ⁵¹⁷	73.02 ⁸⁶
11.2	47.981 ³²⁶	31.53 ²⁴⁶	42.138 ⁴⁹⁵	05.89 ²⁵⁷	15.087 ⁴⁹⁵	72.16 ²⁵
21.2	48.307 ²⁹⁶	33.99 ²⁵⁰	42.633 ⁴⁴⁸	08.46 ²⁹³	15.582 ⁴⁵⁶	71.91 ³⁵
31.1	48.603 ²⁶⁰	36.49 ²⁴⁷	43.081 ³⁹¹	11.39 ³²⁰	16.038 ⁴⁰⁴	72.26 ⁹²
Feb. 10.1	48.863 ²¹⁸	38.96 ²³⁷	43.472 ³²⁸	14.59 ³³⁹	16.442 ³⁴⁰	73.18 ¹⁴⁴
20.1	49.081 ¹⁷⁵	41.33 ²²⁴	43.800 ²⁶⁰	17.98 ³⁴⁹	16.782 ²⁶⁶	74.62 ¹⁸⁹
Mar. 2.1	49.256 ¹³¹	43.57 ²⁰⁵	44.060 ¹⁹²	21.47 ³⁵¹	17.048 ¹⁸⁹	76.51 ²²⁵
12.0	49.387 ⁹⁰	45.62 ¹⁸⁴	44.252 ¹²⁵	24.98 ³⁴⁵	17.237 ¹¹¹	78.76 ²⁵⁰
22.0	49.477 ⁵¹	47.46 ¹⁶¹	44.377 ⁶⁰	28.43 ³³³	17.348 ³⁵	81.26 ²⁶³
31.9	49.528 ¹⁷	49.07 ¹³⁸	44.437 ¹	31.76 ³¹⁴	17.383 ³⁷	83.89 ²⁶⁶
Apr. 10.9	49.545 ¹³	50.45 ¹¹²	44.438 ⁵⁴	34.90 ²⁸⁹	17.346 ¹⁰⁰	86.55 ²⁵⁸
20.9	49.532 ³⁹	51.57 ⁸⁸	44.384 ¹⁰⁴	37.79 ²⁵⁹	17.246 ¹⁵⁵	89.13 ²³⁹
30.9	49.493 ⁵⁹	52.45 ⁶³	44.280 ¹⁴⁷	40.38 ²²³	17.091 ¹⁹⁹	91.52 ²¹⁴
May 10.9	49.434 ⁷⁷	53.08 ³⁸	44.133 ¹⁸⁵	42.61 ¹⁸⁵	16.892 ²³⁵	93.66 ¹⁷⁹
20.8	49.357 ⁹⁰	53.46 ¹⁴	43.948 ²¹⁷	44.46 ¹⁴³	16.657 ²⁶¹	95.45 ¹⁴⁰
30.8	49.267 ¹⁰⁰	53.60 ¹⁰	43.731 ²⁴³	45.89 ⁹⁸	16.396 ²⁷⁷	96.85 ⁹⁷
June 9.8	49.167 ¹⁰⁷	53.50 ³²	43.488 ²⁶²	46.87 ⁵¹	16.119 ²⁸⁵	97.82 ⁵⁰
19.8	49.060 ¹¹¹	53.18 ⁵⁴	43.226 ²⁷³	47.38 ⁴	15.834 ²⁸⁴	98.32 ²
29.7	48.949 ¹¹¹	52.64 ⁷⁴	42.953 ²⁷⁷	47.42 ⁴³	15.550 ²⁷⁵	98.34 ⁴⁴
July 9.7	48.838 ¹⁰⁷	51.90 ⁹²	42.676 ²⁷²	46.99 ⁹¹	15.275 ²⁶¹	97.90 ⁹²
19.7	48.731 ¹⁰⁰	50.98 ¹⁰⁶	42.404 ²⁵⁸	46.08 ¹³³	15.014 ²³⁸	96.98 ¹³⁶
29.7	48.631 ⁸⁸	49.92 ¹¹⁷	42.146 ²³³	44.75 ¹⁷¹	14.776 ²¹²	95.62 ¹⁷⁸
Aug. 8.6	48.543 ⁷¹	48.75 ¹²⁴	41.913 ¹⁹⁹	43.04 ²⁰⁵	14.564 ¹⁷⁶	93.84 ²¹⁸
18.6	48.472 ⁴⁹	47.51 ¹²⁶	41.714 ¹⁵⁴	40.99 ²³²	14.388 ¹³⁷	91.66 ²⁵³
28.6	48.423 ²²	46.25 ¹²¹	41.560 ⁹⁹	38.67 ²⁵⁰	14.251 ⁹⁰	89.13 ²⁸⁴
Sept. 7.5	48.401 ¹²	45.04 ¹¹²	41.461 ³⁵	36.17 ²⁵⁹	14.161 ³²	86.29 ³⁰⁹
17.5	48.413 ⁴⁹	43.92 ⁹⁶	41.426 ³⁸	33.58 ²⁴⁷	14.122 ¹⁹	83.20 ³³⁰
27.5	48.462 ⁹²	42.96 ⁷³	41.464 ¹¹⁵	30.99 ²⁴⁹	14.141 ⁷⁹	79.90 ³⁴⁴
Oct. 7.5	48.554 ¹³⁷	42.23 ⁴⁵	41.579 ¹⁹⁴	28.52 ²²⁴	14.220 ¹⁴⁶	76.46 ³⁵¹
17.4	48.691 ¹⁸²	41.78 ¹²	41.773 ²⁷⁵	26.28 ¹⁹¹	14.366 ²¹⁴	72.95 ³⁵²
27.4	48.873 ²²⁸	41.66 ²⁴	42.048 ³⁵⁰	24.37 ¹⁵⁰	14.580 ²⁸¹	69.43 ³⁴³
Nov. 6.4	49.101 ²⁶⁹	41.90 ⁶³	42.398 ⁴¹⁸	22.87 ¹⁰¹	14.861 ³⁴⁵	66.00 ³²⁷
16.4	49.370 ³⁰⁴	42.53 ¹⁰¹	42.816 ⁴⁷⁴	21.86 ⁴⁷	15.206 ⁴⁰³	62.73 ³⁰¹
26.3	49.674 ³³³	43.54 ¹³⁹	43.290 ⁵¹⁶	21.39 ¹²	15.609 ⁴⁵²	59.72 ²⁶⁷
Dec. 6.3	50.007 ³⁵⁰	44.93 ¹⁷²	43.806 ⁵⁴³	21.51 ⁷⁰	16.061 ⁴⁹⁰	57.05 ²²⁵
16.3	50.357 ³⁵⁸	46.65 ²⁰¹	44.349 ⁵⁵¹	22.21 ¹²⁸	16.551 ⁵¹²	54.80 ¹⁷⁶
26.2	50.715 ³⁵³	48.66 ²²⁴	44.900 ⁵⁴²	23.49 ¹⁸¹	17.063 ⁵¹⁸	53.04 ¹²⁰
36.2	51.068	50.90	45.442	25.30	17.581	51.84
Mean Place	46.653	29.52	40.871	14.19	12.971	97.01
Secδ, Tanδ	1.080	-0.409	1.908	-1.625	1.856	+1.563
a, a'	+3.1	-20.0	+3.2	-20.0	+3.0	-20.0
b, b'	+0.03	0.0	+0.11	+0.1	-0.10	+0.1
Authority and Catalogue No.	B.J.	735	A.N.	738	B.J.	739

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	γ Corvi			β Chamæleontis			η Virginis		
	2.78	B8		4.38	B5		4.00	A0	
Mean Solar Date	R.A.	Dec.		R.A.	Dec.		R.A.	Dec.	
	^h 12	^m 12	^s -17 10	^h 12	^m 14	^s -78 56	^h 12	^m 16	^s - 0 18
Jan. 1.2	28.540	342	53.35	29.85	125	51.71	35.740		27.87
11.2	28.882	322	55.65	31.10	118	53.44	36.073	333	30.01
21.2	29.204	294	58.02	32.28	106	55.72	36.388	315	32.03
31.1	29.498	260	60.36	33.34	92	58.48	36.678	290	33.87
Feb. 10.1	29.758	220	62.63	34.26	77	61.64	36.934	256	35.49
20.1	29.978		64.78	35.03	60	65.10	37.152	218	36.84
Mar. 2.1	30.156	178	66.76	35.63	43	68.79	37.330	178	37.92
12.0	30.291	135	68.53	36.06	25	72.62	37.467	137	38.72
22.0	30.386	95	70.07	36.31	8	76.48	37.563	96	39.26
31.9	30.443	57	71.39	36.39	9	80.31	37.622	59	39.54
Apr. 10.9	30.466	6	72.47	36.30	25	84.02	37.647	25	39.61
20.9	30.460	31	73.31	36.05	39	87.53	37.644	3	39.49
30.9	30.429	53	73.92	35.66	52	90.78	37.616	28	39.21
May 10.9	30.376	69	74.32	35.14	65	93.69	37.568	48	38.82
20.8	30.307	82	74.51	34.49	75	96.21	37.503	65	38.33
30.8	30.225	93	74.49	33.74	84	98.29	37.426	77	37.77
June 9.8	30.132	100	74.28	32.90	89	99.88	37.340	86	37.17
19.8	30.032	104	73.89	32.01	94	100.95	37.248	92	36.54
29.7	29.928	104	73.33	31.07	95	101.48	37.152	96	35.92
July 9.7	29.824	102	72.63	30.12	93	101.44	37.055	97	35.31
19.7	29.722	96	71.80	29.19	88	100.86	36.961	94	34.73
29.7	29.626	85	70.86	28.31	81	99.74	36.873	88	34.21
Aug. 8.6	29.541	70	69.86	27.50	69	98.13	36.795	78	33.76
18.6	29.471	50	68.83	26.81	57	96.06	36.730	65	33.41
28.6	29.421	24	67.81	26.24	40	93.62	36.683	47	33.19
Sept. 7.5	29.397	8	66.85	25.84	21	90.88	36.660	33	33.13
17.5	29.405	43	66.01	25.63	1	87.95	36.665	5	33.25
27.5	29.448	84	65.34	25.62	20	84.93	36.704	39	33.59
Oct. 7.5	29.532	127	64.90	25.82	42	81.94	36.780	76	34.16
17.4	29.659	172	64.73	26.24	62	79.10	36.896	116	35.00
27.4	29.831	216	64.88	26.86	82	76.52	37.055	159	36.10
Nov. 6.4	30.047	258	65.36	27.68	99	74.33	37.257	202	37.46
16.4	30.305	293	66.20	28.67	113	72.61	37.498	241	39.08
26.3	30.598	321	67.39	29.80	124	71.44	37.775	277	40.91
Dec. 6.3	30.919	341	68.91	31.04	129	70.88	38.080	305	42.92
16.3	31.260	349	70.71	32.33	132	70.95	38.406	326	45.05
26.2	31.609	347	72.76	33.65	129	71.67	38.742	336	47.24
36.2	31.956		74.97	34.94		73.02	39.077	335	49.41
Mean Place	27.572	51.89		29.639	65.23		34.718	20.38	
Sec δ , Tan δ	1.047	- 0.309		5.218	- 5.121		1.000	- 0.005	
a, a'	+3.1	-20.0		+3.5	-20.0		3.1	-20.0	
b, b'	+0.02	+ 0.1		+0.34	+ 0.1		0.00	+ 0.1	
Authority and Catalogue No.	A.N.	740		B.J.	742		B.J.	744	

APPARENT PLACES OF STARS, 1935

439

AT UPPER TRANSIT AT GREENWICH

Name	α^1 Crucis			δ Corvi			γ Crucis			
Mag. Spect.	1.58		Br	3.11		Ao	1.61		Mb	
Mean Solar Date	R.A.		Dec.	R.A.		Dec.	R.A.		Dec.	
	^h 12	^m 22	[°] 62 ['] 44	^h 12	^m 26	[°] 16 ['] 09	^h 12	^m 27	[°] 56 ['] 44	
Jan. 1.2	58.62	60	09.26	30.711	344	15.28	33.460	523	47.57	198
11.2	59.22	57	11.19	31.055	328	17.52	33.983	494	49.55	240
21.2	59.79	51	13.59	31.383	301	19.82	34.477	453	51.95	277
31.2	60.30	46	16.40	31.684	269	22.10	34.930	403	54.72	306
Feb. 10.1	60.76	38	19.52	31.953	231	24.30	35.333	345	57.78	325
20.1	61.14	31	22.88	32.184	191	26.37	35.678	282	61.03	337
Mar. 2.1	61.45	24	26.38	32.375	150	28.27	35.960	217	64.40	341
12.0	61.69	16	29.94	32.525	109	29.97	36.177	154	67.81	341
22.0	61.85	9	33.50	32.634	72	31.45	36.331	93	71.18	337
31.9	61.94	2	36.96	32.706	39	32.70	36.424	35	74.45	310
Apr. 10.9	61.96	4	40.27	32.745	8	33.72	36.459	18	77.55	287
20.9	61.92	11	43.35	32.753	18	34.51	36.441	67	80.42	260
30.9	61.81	16	46.16	32.735	40	35.08	36.374	112	83.02	228
May 10.9	61.65	20	48.63	32.695	58	35.45	36.262	150	85.30	191
20.9	61.45	24	50.72	32.637	74	35.62	36.112	184	87.21	152
30.8	61.21	28	52.40	32.563	86	35.60	35.928	212	88.73	109
June 9.8	60.93	31	53.62	32.477	95	35.40	35.716	235	89.82	64
19.8	60.62	32	54.36	32.382	102	35.04	35.481	250	90.46	18
29.7	60.30	34	54.62	32.280	104	34.53	35.231	259	90.64	28
July 9.7	59.96	33	54.39	32.176	105	33.88	34.972	258	90.36	73
19.7	59.63	31	53.66	32.071	101	33.11	34.714	250	89.63	116
29.7	59.32	30	52.48	31.970	92	32.25	34.464	232	88.47	155
Aug. 8.6	59.02	25	50.86	31.878	79	31.33	34.232	202	86.92	189
18.6	58.77	20	48.87	31.799	61	30.38	34.030	164	85.03	218
28.6	58.57	14	46.57	31.738	36	29.44	33.866	114	82.85	238
Sept. 7.6	58.43	7	44.04	31.702	6	28.56	33.752	55	80.47	249
17.5	58.36	1	41.37	31.696	29	27.80	33.697	11	77.98	251
27.5	58.37	10	38.67	31.725	69	27.20	33.708	86	75.47	242
Oct. 7.5	58.47	19	36.05	31.794	113	26.80	33.794	164	73.05	223
17.4	58.66	29	33.61	31.907	158	26.67	33.958	241	70.82	194
27.4	58.95	37	31.46	32.065	203	26.84	34.199	316	68.88	155
Nov. 6.4	59.32	45	29.70	32.268	246	27.34	34.515	386	67.33	109
16.4	59.77	52	28.41	32.514	284	28.18	34.901	444	66.24	57
26.3	60.29	57	27.66	32.798	314	29.35	35.345	489	65.67	1
Dec. 6.3	60.86	60	27.49	33.112	335	30.84	35.834	520	65.66	56
16.3	61.46	62	27.92	33.447	347	32.60	36.354	534	66.22	112
26.3	62.08	61	28.94	33.794	347	34.60	36.888	531	67.34	165
36.2	62.69		30.52	34.141		36.76	37.419		68.99	
Mean Place	58.032		20.43	29.815		13.25	32.836		57.48	
Sec δ , Tan δ	2.183		- 1.941	1.041		- 0.290	1.824		- 1.525	
a, a'	+3.3		-19.9	+3.1		-19.9	+3.3		-19.9	
b, b'	+0.13		+ 0.1	+0.02		+ 0.1	+0.10		+ 0.1	
Authority and Catalogue No.	A.E.		748	B.J.		755	A.N.		757	

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	κ Draconis		β Corvi		α Muscae	
Mag. Spect.	3.88	B5p	2.84	G5	2.94	B3
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 12 30	[°] ['] +70 07	^h ^m 12 30	[°] ['] -23 02	^h ^m 12 33	[°] ['] -68 46
Jan. 1.2	44.80 ⁷⁵	80.48 ⁷⁵	58.914 ³⁵⁶	14.51 ²²³	17.49 ⁷⁴	27.24 ¹⁶⁷
11.2	45.55 ⁷³	79.73 ⁹	59.270 ³⁴⁰	16.74 ²³⁵	18.23 ⁷⁰	28.91 ²²⁰
21.2	46.28 ⁶⁹	80.19 ⁵⁵	59.610 ³¹³	19.09 ²⁴⁰	18.93 ⁶⁵	31.11 ²⁶⁵
31.2	46.97 ⁶¹	81.35 ¹¹⁶	59.923 ²⁸¹	21.49 ²⁴⁰	19.58 ⁵⁷	33.76 ³⁰²
Feb. 10.1	47.58 ⁵³	81.35 ¹⁷²	60.204 ²⁴¹	23.89 ²³²	20.15 ⁴⁹	36.78 ³³⁰
20.1	48.11 ⁴²	83.07 ²¹⁹	60.445 ²⁰¹	26.21 ²²¹	20.64 ⁴¹	40.08 ³⁵¹
Mar. 2.1	48.53 ³¹	85.26 ²⁵⁷	60.646 ¹⁵⁹	28.42 ²⁰⁵	21.05 ³¹	43.59 ³⁶³
12.1	48.84 ¹⁹	87.83 ²⁸²	60.805 ¹¹⁸	30.47 ¹⁸⁶	21.36 ²²	47.22 ³⁶⁶
22.0	49.03 ³¹	90.65 ²⁹⁷	60.923 ⁷⁹	32.33 ¹⁶⁴	21.58 ¹³	50.88 ³⁶¹
31.9	49.09 ⁵	93.62 ²⁹⁷	61.002 ⁴⁴	33.97 ¹⁴²	21.71 ⁴	54.49 ³⁴⁹
Apr. 10.9	49.04 ¹⁶	96.59 ²⁸⁸	61.046 ¹³	35.39 ¹¹⁹	21.75 ⁴	57.98 ³³¹
20.9	48.88 ²⁶	99.47 ²⁶⁷	61.059 ¹⁵	36.58 ⁹⁵	21.71 ¹²	61.29 ³⁰⁶
30.9	48.62 ³⁴	102.14 ²³⁷	61.044 ³⁸	37.53 ⁷²	21.59 ¹⁹	64.35 ²⁷⁴
May 10.9	48.28 ⁴¹	104.51 ¹⁹⁹	61.006 ⁵⁸	38.25 ⁴⁸	21.40 ²⁶	67.09 ²³⁸
20.9	47.87 ⁴⁶	106.50 ¹⁵⁵	60.948 ⁷⁶	38.73 ²⁵	21.14 ³²	69.47 ¹⁹⁷
30.8	47.41 ⁵⁰	108.05 ¹⁰⁶	60.872 ⁹⁰	38.98 ²	20.82 ³⁶	71.44 ¹⁵¹
June 9.8	46.91 ⁵²	109.11 ⁵³	60.782 ¹⁰⁰	39.00 ²⁰	20.46 ⁴¹	72.95 ¹⁰³
19.8	46.39 ⁵²	109.64 ¹	60.682 ¹¹⁰	38.80 ⁴²	20.05 ⁴²	73.98 ⁵²
29.8	45.87 ⁵²	109.65 ⁵²	60.572 ¹¹³	38.38 ⁶¹	19.63 ⁴⁴	74.50 [—]
July 9.7	45.35 ⁵⁰	109.13 ¹⁰⁴	60.459 ¹¹⁴	37.77 ⁸⁰	19.19 ⁴⁵	74.50 ⁵²
19.7	44.85 ⁴⁷	108.09 ¹⁵⁴	60.345 ¹¹⁰	36.97 ⁹⁵	18.74 ⁴³	73.98 ¹⁰²
29.7	44.38 ⁴³	106.55 ²⁰⁰	60.235 ¹⁰³	36.02 ¹⁰⁸	18.31 ⁴¹	72.96 ¹⁴⁹
Aug. 8.6	43.95 ³⁸	104.55 ²⁴³	60.132 ⁸⁹	34.94 ¹¹⁷	17.90 ³⁶	71.47 ¹⁹¹
18.6	43.57 ³¹	102.12 ²⁸²	60.043 ⁷⁰	33.77 ¹²¹	17.54 ²⁹	69.56 ²²⁷
28.6	43.26 ²³	99.30 ³¹³	59.973 ⁴⁴	32.56 ¹²⁰	17.25 ²²	67.29 ²⁵⁶
Sept. 7.6	43.03 ¹⁶	96.17 ³⁴¹	59.929 ¹³	31.36 ¹¹²	17.03 ¹³	64.73 ²⁷⁴
17.5	42.87 ⁷	92.76 ³⁶⁰	59.916 ²⁴	30.24 ¹⁰⁰	16.90 ¹³	61.99 ²⁸³
27.5	42.80 ²	89.16 ³⁷⁴	59.940 ⁶⁷	29.24 ⁷⁹	16.87 ⁹	59.16 ²⁸²
Oct. 7.5	42.82 ¹³	85.42 ³⁷⁹	60.007 ¹¹³	28.45 ⁵⁵	16.96 ²⁰	56.34 ²⁶⁶
17.5	42.95 ²³	81.63 ³⁷⁷	60.120 ¹⁶⁰	27.90 ²⁵	17.16 ³²	53.68 ²⁴²
27.4	43.18 ³⁴	77.86 ³⁶⁵	60.280 ²⁰⁷	27.65 ¹⁰	17.48 ⁴⁴	51.26 ²⁰⁶
Nov. 6.4	43.52 ⁴⁴	74.21 ³⁴⁴	60.487 ²⁵³	27.75 ⁴⁷	17.92 ⁵³	49.20 ¹⁶⁰
16.4	43.96 ⁵³	70.77 ³¹⁴	60.740 ²⁹²	28.22 ⁸⁵	18.45 ⁶²	47.60 ¹⁰⁸
26.3	44.49 ⁶¹	67.63 ²⁷⁶	61.032 ³²⁴	29.07 ¹²¹	19.07 ⁶⁸	46.52 ⁵¹
Dec. 6.3	45.10 ⁶⁸	64.87 ²²⁸	61.356 ³⁴⁶	30.28 ¹⁵⁵	19.75 ⁷³	46.01 ¹¹
16.3	45.78 ⁷³	62.59 ¹⁷³	61.702 ³⁵⁹	31.83 ¹⁸⁵	20.48 ⁷⁶	46.12 ⁷¹
26.3	46.51 ⁷⁴	60.86 ¹¹²	62.061 ³⁵⁹	33.68 ²⁰⁹	21.24 ⁷⁵	46.83 ¹³¹
36.2	47.25	59.74	62.420	35.77	21.99	48.14
Mean Place	43.131	106.59	58.073	14.77	17.144	39.29
Sec 8, Tan 8	2.944	+ 2.769	1.087	- 0.425	2.763	- 2.575
α, α'	+2.6	-19.9	+3.1	-19.9	+3.6	-19.8
b, b'	-0.18	+ 0.1	+0.03	+ 0.1	+0.17	+ 0.1
Authority and Catalogue No.	B.J.	760	B.J.	761	B.J.	764

† Second transit, Mar. 31

APPARENT PLACES OF STARS, 1935

441

AT UPPER TRANSIT AT GREENWICH

Name	γ Centauri m.		γ Virginis m.		ρ Virginis	
	2.38	Ao	2.91	Fo	4.95	Ao
Mag. Spect.						
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₂ ^m ₃₇	^h ₄₈ ^m ₃₆	^h ₁₂ ^m ₃₈	^h ₁ ^m ₀₅	^h ₁₂ ^m ₃₈	^h ₁₀ ^m ₃₅
Jan. 1.2	55.921	02.66	22.725	42.61	36.552	25.20
11.2	56.377	04.61	23.060	44.74	36.891	23.16
21.2	56.813	06.95	23.382	46.77	37.217	21.34
31.2	57.215	09.60	23.682	48.64	37.522	19.83
Feb. 10.1	57.576	12.48	23.952	50.29	37.798	18.64
20.1	57.888	15.51	24.187	51.68	38.036	17.78
Mar. 2.1	58.149	18.62	24.383	52.80	38.236	17.27
12.1	58.356	21.73	24.540	53.64	38.395	17.09
22.0	58.510	24.78	24.658	54.21	38.512	17.24
Apr. 1.0	58.613	27.70	24.739	54.53	38.592	17.61
10.9	58.669	30.45	24.785	54.63	38.637	18.22
20.9	58.679	32.99	24.802	54.53	38.650	18.98
30.9	58.649	35.26	24.793	54.27	38.636	19.87
May 10.9	58.583	37.24	24.761	53.88	38.599	20.81
20.9	58.484	38.88	24.710	53.39	38.543	21.76
30.8	58.357	40.17	24.644	52.83	38.471	22.69
June 9.8	58.205	41.08	24.566	52.22	38.386	23.59
19.8	58.033	41.58	24.477	51.59	38.293	24.38
29.8	57.846	41.68	24.382	50.96	38.193	25.06
July 9.7	57.650	41.38	24.283	50.34	38.089	25.62
19.7	57.450	40.67	24.183	49.75	37.985	26.04
29.7	57.255	39.59	24.085	49.21	37.885	26.30
Aug. 8.6	57.072	38.17	23.994	48.74	37.791	26.38
18.6	56.908	36.45	23.913	48.37	37.709	26.28
28.6	56.774	34.49	23.849	48.11	37.642	25.98
Sept. 7.6	56.677	32.37	23.806	48.01	37.600	25.48
17.5	56.628	30.15	23.789	48.09	37.581	24.74
27.5	56.632	27.94	23.805	48.37	37.595	23.77
Oct. 7.5	56.697	25.82	23.858	48.88	37.646	22.54
17.5	56.827	23.90	23.952	49.64	37.738	21.09
27.4	57.023	22.27	24.090	50.66	37.873	19.38
Nov. 6.4	57.284	21.00	24.271	51.95	38.053	17.49
16.4	57.605	20.17	24.495	53.49	38.274	15.39
26.3	57.978	19.82	24.757	55.26	38.535	13.16
Dec. 6.3	58.394	19.99	25.051	57.21	38.829	10.86
16.3	58.838	20.68	25.369	59.29	39.148	08.54
26.3	59.298	21.88	25.701	61.45	39.482	06.28
36.2	59.759	23.55	26.037	63.61	39.820	04.13
Mean Place	55.284	10.50	21.836	35.05	35.617	36.89
Sec δ , Tan δ	1.512	-1.134	1.000	-0.019	1.017	+0.187
a, a'	+3.3	-19.8	+3.1	-19.8	+3.0	-19.8
b, b'	+0.07	+0.2	0.00	+0.2	-0.01	+0.2
Authority and Catalogue No.	B.J.	768	A.N.	769	A.E.	770

No. 769. The reductions from mean to brighter star vary during the year from $+0^{\circ}.133$, $-2^{\circ}.32$ to $+0^{\circ}.134$, $-2^{\circ}.31$. The signs should be changed for reductions from mean to fainter star.

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	β Muscae m.		β Crucis		35 Virginis	
	3.26	B ₃	1.50	B ₁	6.66	Ma
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₂ ^m ₄₂	[°] ₋₆₇ ['] ₄₄	^h ₁₂ ^m ₄₃	[°] ₋₅₉ ['] ₁₉	^h ₁₂ ^m ₄₄	[°] ₊ ['] ₃ ['] ₅₅
Jan. 1.3	16.65	57.41 ¹⁵⁸	54.975 ⁵⁶³	50.91 ¹⁷²	33.603 ³³⁷	29.03 ²¹¹
11.2	17.37 ⁷²	58.99 ²⁰⁸	55.538 ⁵³⁹	52.63 ²¹⁸	33.940 ³²⁵	26.92 ¹⁹⁵
21.2	18.06 ⁶⁴	61.07 ²⁵⁴	56.077 ⁵⁰⁰	54.81 ²⁵⁸	34.265 ³⁰⁴	24.97 ¹⁷²
31.2	18.70	63.61 ²⁹²	56.577 ⁴⁵⁰	57.39 ²⁹⁰	34.569 ²⁷⁵	23.25 ¹⁴⁷
Feb. 10.1	19.27 ⁵⁰	66.53 ³²²	57.027 ³⁹²	60.29 ³¹⁵	34.844 ²⁴¹	21.78 ¹¹⁶
20.1	19.77	69.75	57.419	63.44	35.085 ²⁰³	20.62 ⁸⁷
Mar. 2.1	20.18 ⁴¹	73.18 ³⁴³	57.748 ³²⁹	66.74 ³³⁰	35.288 ¹⁶⁴	19.75 ⁵⁵
12.1	20.51 ³³	76.74 ³⁵⁶	58.011 ²⁶³	70.12 ³³⁸	35.452 ¹²⁴	19.20 ²⁷
22.0	20.75 ²⁴	80.34 ³⁶⁰	58.207 ¹⁹⁶	73.51 ³³⁹	35.576 ⁸⁷	18.93 ¹
Apr. 1.0	20.90 ¹⁵	83.91 ³⁵⁷	58.338 ¹³¹	76.83 ³³²	35.663 ⁵²	18.92 ²²
10.9	20.97 ³	87.38 ³⁴⁹	58.407 ¹⁰	80.02 ³⁰⁰	35.715 ²²	19.14 ⁴⁰
20.9	20.96 ¹	90.67 ³⁰⁶	58.417 ⁴⁵	83.02 ²⁷⁵	35.737 ⁵	19.54 ⁵⁴
30.9	20.87 ¹⁶	93.73 ²⁷⁶	58.372 ⁹⁵	85.77 ²⁴⁶	35.732 ²⁸	20.08 ⁶⁵
May 10.9	20.71 ²²	96.49 ²⁴¹	58.277 ¹⁴¹	88.23 ²¹²	35.704 ⁴⁸	20.73 ⁷¹
20.9	20.49 ²⁸	98.90 ²⁰¹	58.136 ¹⁸²	90.35 ¹⁷³	35.656 ⁶⁴	21.44 ⁷⁴
30.8	20.21 ³³	100.91 ¹⁵⁷	57.954 ²¹⁷	92.08 ¹³²	35.592 ⁷⁷	22.18 ⁷⁴
June 9.8	19.88 ³⁷	102.48 ¹¹⁰	57.737 ²⁴⁷	93.40 ⁸⁷	35.515 ⁸⁸	22.92 ⁷³
19.8	19.51 ⁴⁰	103.58 ⁵⁹	57.490 ²⁶⁹	94.27 ⁴¹	35.427 ⁹⁵	23.65 ⁶⁷
29.8	19.11 ⁴²	104.17 ⁹	57.221 ²⁸³	94.68 ⁶	35.332 ¹⁰⁰	24.32 ⁶²
July 9.7	18.69 ⁴²	104.26 ⁴²	56.938 ²⁸⁸	94.62 ⁵²	35.232 ¹⁰²	24.94 ⁵³
19.7	18.27 ⁴²	103.84 ⁹³	56.650 ²⁸⁴	94.10 ⁹⁹	35.130 ⁹⁹	25.47 ⁴³
29.7	17.85 ³⁹	102.91 ¹³⁹	56.366 ²⁶⁹	93.11 ¹⁴⁰	35.031 ⁹⁴	25.90 ³¹
Aug. 8.7	17.46 ³⁵	101.52 ¹⁸²	56.097 ²⁴¹	91.71 ¹⁷⁷	34.937 ⁸⁴	26.21 ¹⁸
18.6	17.11 ²⁹	99.70 ²¹⁹	55.856 ²⁰⁴	89.94 ²¹⁰	34.853 ⁶⁹	26.39 ²
28.6	16.82 ²³	97.51 ²⁴⁸	55.652 ¹⁵²	87.84 ²³⁵	34.784 ⁴⁷	26.41 ¹⁵
Sept. 7.6	16.59 ¹⁴	95.03 ²⁶⁸	55.500 ⁹¹	85.49 ²⁵⁰	34.737 ²²	26.26 ³⁶
17.5	16.45 ⁴	92.35 ²⁷⁹	55.409 ²⁰	82.99 ²⁵⁷	34.715 ¹⁰	25.90 ⁵⁷
27.5	16.41 ⁶	89.56 ²⁷⁹	55.389 ⁵⁸	80.42 ²⁵⁴	34.725 ⁴⁶	25.33 ⁸¹
Oct. 7.5	16.47 ¹⁸	86.77 ²⁶⁶	55.447 ¹⁴²	77.88 ²³⁸	34.771 ⁸⁸	24.52 ¹⁰⁶
17.5	16.65 ²⁹	84.11 ²⁴³	55.589 ²²⁸	75.50 ²¹⁴	34.859 ¹³⁰	23.46 ¹³¹
27.4	16.94 ³⁹	81.68 ²⁰⁹	55.817 ³¹¹	73.36 ¹⁷⁸	34.989 ¹⁷⁵	22.15 ¹⁵⁵
Nov. 6.4	17.33 ⁵⁰	79.59 ¹⁶⁶	56.128 ³⁸⁷	71.58 ¹³⁵	35.164 ²¹⁸	20.60 ¹⁷⁷
16.4	17.83 ⁵⁸	77.93 ¹¹⁵	56.515 ⁴⁵⁴	70.23 ⁸⁵	35.382 ²⁵⁷	18.83 ¹⁹⁷
26.4	18.41 ⁶⁵	76.78 ⁵⁹	56.969 ⁵⁰⁷	69.38 ³¹	35.639 ²⁹⁰	16.86 ²¹⁰
Dec. 6.3	19.06 ⁷⁰	76.19 ¹	57.476 ⁵⁴⁵	69.07 ²⁷	35.929 ³¹⁵	14.76 ²²⁰
16.3	19.76 ⁷³	76.20 ⁶²	58.021 ⁵⁶⁶	69.34 ⁸³	36.244 ³³¹	12.56 ²²⁰
26.3	20.49 ⁷³	76.82 ¹²¹	58.587 ⁵⁶⁸	70.17 ¹³⁸	36.575 ³³⁶	10.36 ²¹⁶
36.2	21.22	78.03	59.155	71.55	36.911	08.20
Mean Place	16.374	69.15	54.517	61.12	32.731	38.46
Sec δ , Tan δ	2.641	-2.445	1.961	-1.686	1.002	+0.069
α , α'	+3.7	-19.7	+3.5	-19.7	+3.1	-19.7
δ , δ'	+0.16	+0.2	+0.11	+0.2	0.00	+0.2
Authority and Catalogue No.	A.N.	773	B.J.	775	N.A.	776

APPARENT PLACES OF STARS, 1935

443

AT UPPER TRANSIT AT GREENWICH

Name	31 Comæ		ψ Virginis		ε Ursæ Majoris	
	5.07	Go	4.91	Mb	1.68	Aop
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₂ ^m ₄₈	[°] ₂₇ ['] ₅₃	^h ₁₂ ^m ₅₀	[°] ₉ ['] ₁₁	^h ₁₂ ^m ₅₁	[°] ₅₆ ['] ₁₈
Jan. 1.3	32.940	21.02	58.933	15.35	11.539	20.46
11.2	33.300	19.16	59.274	17.50	12.042	19.12
21.2	33.654	17.73	59.604	19.62	12.536	18.38
31.2	33.983	16.71	59.914	21.67	13.006	18.27
Feb. 10.1	34.284	16.18	60.196	23.58	13.436	18.77
20.1	34.548	16.09	60.443	25.31	13.813	19.84
Mar. 2.1	34.773	16.47	60.653	26.83	14.128	21.44
12.1	34.950	17.24	60.825	28.11	14.373	23.47
22.0	35.083	18.33	60.958	29.16	14.547	25.84
Apr. 1.0	35.171	19.71	61.054	29.96	14.647	28.44
10.9	35.220	21.28	61.117	30.53	14.678	31.16
20.9	35.230	22.97	61.149	30.89	14.644	33.89
30.9	35.209	24.69	61.155	31.08	14.550	36.52
May 10.9	35.157	26.37	61.136	31.08	14.406	38.96
20.9	35.083	27.96	61.098	30.95	14.219	41.12
30.8	34.990	29.39	61.042	30.68	13.996	42.94
June 9.8	34.880	30.64	60.970	30.30	13.747	44.36
19.8	34.761	31.64	60.886	29.83	13.480	45.34
29.8	34.635	32.39	60.793	29.28	13.200	45.87
July 9.7	34.503	32.84	60.694	28.67	12.918	45.90
19.7	34.370	33.00	60.590	28.02	12.640	45.46
29.7	34.239	32.85	60.487	27.34	12.372	44.54
Aug. 8.7	34.117	32.38	60.389	26.66	12.122	43.16
18.6	34.009	31.62	60.299	26.01	11.896	41.35
28.6	33.918	30.54	60.225	25.41	11.702	39.13
Sept. 7.6	33.851	29.17	60.171	24.91	11.546	36.56
17.5	33.811	27.51	60.143	24.54	11.437	33.67
27.5	33.806	25.58	60.148	24.33	11.381	30.51
Oct. 7.5	33.840	23.41	60.191	24.34	11.383	27.13
17.5	33.917	21.01	60.277	24.60	11.451	23.61
27.4	34.041	18.41	60.407	25.12	11.586	20.02
Nov. 6.4	34.213	15.72	60.583	25.93	11.790	16.43
16.4	34.434	12.93	60.802	27.02	12.064	12.94
26.4	34.695	10.13	61.062	28.41	12.403	09.63
Dec. 6.3	34.995	07.38	61.356	30.04	12.799	06.60
16.3	35.326	04.81	61.676	31.89	13.242	03.94
26.3	35.675	02.45	62.011	33.90	13.719	01.74
36.2	36.036	00.38	62.352	36.00	14.215	00.06
Mean Place	32.005	38.51	58.147	10.50	10.490	44.92
Sec δ, Tan δ	1.131	+ 0.529	1.013	- 0.162	1.803	+ 1.500
a, a'	+2.9	-19.6	+3.1	-19.6	+2.6	-19.5
b, b'	-0.03	+ 0.2	+0.01	+ 0.2	-0.10	+ 0.2
Authority and Catalogue No.	A.E.	778	N.A.	781	B.J.	782

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	δ Virginis		ι^2 Canum Venat.		δ Muscae	
Mag. Spect.	3.66	Ma	2.90	Aop	3.63	K2
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 12 ^m 52	[°] + 3 ['] 44	^h 12 ^m 52	[°] + 38 ['] 39	^h 12 ^m 57	[°] - 71 ['] 11
Jan. 1.3	20.474	336	60.306	392	46.17	84
11.2	20.810	327	60.698	383	47.01	81
21.2	21.137	306	61.081	364	47.82	76
31.2	21.443	279	61.445	331	48.58	70
Feb. 10.1	21.722	245	61.776	292	49.28	61
20.1	21.967	208	62.068	246	49.89	52
Mar. 2.1	22.175	170	62.314	196	50.41	43
12.1	22.345	131	62.510	145	50.84	33
22.0	22.476	94	62.655	94	51.17	22
Apr. 1.0	22.570	59	62.749	47	51.39	12
10.9	22.629	29	62.796	3	51.51	-3
20.9	22.658	1	62.799	36	51.54	-6
30.9	22.659	22	62.763	70	51.48	15
May 10.9	22.637	43	62.693	98	51.33	23
20.9	22.594	59	62.595	121	51.10	31
30.8	22.535	74	62.474	140	50.70	37
June 9.8	22.461	86	62.334	153	50.42	43
19.8	22.375	96	62.181	164	49.99	47
29.8	22.279	101	62.017	166	49.52	50
July 9.7	22.178	104	61.851	167	49.02	51
19.7	22.074	103	61.684	163	48.51	51
29.7	21.971	99	61.521	153	48.00	49
Aug. 8.7	21.872	90	61.368	139	47.51	44
18.6	21.782	75	61.229	118	47.07	39
28.6	21.707	56	61.111	92	46.68	31
Sept. 7.6	21.651	30	61.019	62	46.37	21
17.5	21.621	2	60.957	23	46.16	11
27.5	21.623	37	60.934	20	46.05	2
Oct. 7.5	21.660	79	60.954	69	46.07	16
17.5	21.739	122	61.023	119	46.23	29
27.4	21.861	167	61.142	173	46.52	42
Nov. 6.4	22.028	211	61.315	224	46.94	54
16.4	22.239	251	61.539	274	47.48	64
26.4	22.490	285	61.813	317	48.12	73
Dec. 6.3	22.775	311	62.130	351	48.85	80
16.3	23.086	329	62.481	375	49.65	83
26.3	23.415	334	62.856	387	50.48	84
36.2	23.749		63.243		51.32	
Mean Place	19.649	61.39	59.368	68.38	46.211	55.85
Sec δ , Tan δ	1.002	+ 0.066	1.281	+ 0.800	3.103	- 2.937
a, a'	+3.1	-19.5	+2.8	-19.5	+4.1	-19.4
b, b'	0.00	+ 0.2	-0.05	+ 0.2	+0.19	+ 0.2
Authority and Catalogue No.	B.J.	784	B.J.	786	A.N.	787

APPARENT PLACES OF STARS, 1935

445

AT UPPER TRANSIT AT GREENWICH

Name	ε Virginis		θ Virginis		γ Hydræ	
	2.95	Ko	4.46	Ao	3.33	G5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 12 ^m 58	+11° [′] 17	^h 13 ^m 06	— 5° [′] 11	^h 13 ^m 15	—22° [′] 49
Jan. 1.3	57.212 ₃₄₀	77.37 ₂₀₈	35.591 ₃₄₀	38.90 ₂₁₁	23.546 ₃₆₃	45.49 ₁₉₄
11.2	57.552 ₃₃₁	75.29 ₁₈₄	35.931 ₃₃₁	41.01 ₂₀₆	23.909 ₃₅₅	47.43 ₂₀₉
21.2	57.883 ₃₁₂	73.45 ₁₅₄	36.262 ₃₁₄	43.07 ₁₉₃	24.264 ₃₃₆	49.52 ₂₁₆
31.2	58.195 ₂₈₆	71.91 ₁₂₂	36.576 ₂₈₈	45.00 ₁₇₆	24.600 ₃₁₁	51.68 ₂₁₈
Feb. 10.2	58.481 ₂₅₃	70.69 ₈₅	36.864 ₂₅₆	46.76 ₁₅₅	24.911 ₂₇₉	53.86 ₂₁₃
20.1	58.734 ₂₁₆	69.84 ₅₀	37.120 ₂₂₂	48.31 ₁₃₀	25.190 ₂₄₃	55.99 ₂₀₃
Mar. 2.1	58.950 ₁₇₇	69.34 ₁₅	37.342 ₁₈₄	49.61 ₁₀₅	25.433 ₂₀₅	58.02 ₁₉₁
12.1	59.127 ₁₃₈	69.19 ₁₆	37.526 ₁₄₈	50.66 ₇₉	25.638 ₁₆₇	59.93 ₁₇₄
22.0	59.265 ₁₀₀	69.35 ₄₅	37.674 ₁₁₁	51.45 ₅₄	25.805 ₁₃₁	61.67 ₁₅₅
Apr. 1.0	59.365 ₆₄	69.80 ₆₇	37.785 ₇₈	51.99 ₃₁	25.936 ₉₅	63.22 ₁₃₆
10.9	59.429 ₃₂	70.47 ₈₅	37.863 ₄₇	52.30 ₁₁	26.031 ₆₂	64.58 ₁₁₆
20.9	59.461 ₃	71.32 ₉₆	37.910 ₁₉	52.41 ₇	26.093 ₃₃	65.74 ₉₅
30.9	59.464 ₂₁	72.28 ₁₀₄	37.929 ₅	52.34 ₂₁	26.126 ₅	66.69 ₇₅
May 10.9	59.443 ₄₄	73.32 ₁₀₆	37.924 ₂₇	52.13 ₃₄	26.131 ₂₀	67.44 ₅₅
20.9	59.399 ₆₁	74.38 ₁₀₃	37.897 ₄₇	51.79 ₄₃	26.111 ₄₂	67.99 ₃₅
30.9	59.338 ₇₇	75.41 ₉₇	37.850 ₆₃	51.36 ₅₆	26.069 ₆₃	68.34 ₁₅
June 9.8	59.261 ₉₀	76.38 ₈₈	37.787 ₇₇	50.86 ₅₀	26.006 ₈₁	68.49 ₄
19.8	59.171 ₁₀₀	77.26 ₇₈	37.710 ₉₀	50.30 ₆₁	25.925 ₉₇	68.45 ₂₃
29.8	59.071 ₁₀₅	78.04 ₆₂	37.620 ₉₈	49.69 ₆₁	25.828 ₁₀₉	68.22 ₄₁
July 9.7	58.966 ₁₁₀	78.66 ₄₇	37.522 ₁₀₄	49.08 ₆₁	25.719 ₁₁₇	67.81 ₅₉
19.7	58.856 ₁₀₉	79.13 ₃₀	37.418 ₁₀₆	48.47 ₆₀	25.602 ₁₂₂	67.22 ₇₄
29.7	58.747 ₁₀₆	79.43 ₁₂	37.312 ₁₀₄	47.87 ₅₇	25.480 ₁₂₁	66.48 ₈₇
Aug. 8.7	58.641 ₉₇	79.55 ₈	37.208 ₉₇	47.30 ₅₀	25.359 ₁₁₅	65.61 ₉₇
18.6	58.544 ₈₃	79.47 ₂₉	37.111 ₈₅	46.80 ₄₂	25.244 ₁₀₁	64.64 ₁₀₄
28.6	58.461 ₆₃	79.18 ₅₁	37.026 ₆₆	46.38 ₃₀	25.143 ₈₂	63.60 ₁₀₇
Sept. 7.6	58.398 ₃₉	78.67 ₇₄	36.960 ₄₁	46.08 ₁₆	25.061 ₅₅	62.53 ₁₀₃
17.6	58.359 ₇	77.93 ₉₉	36.919 ₁₀	45.92 ₃	25.006 ₂₀	61.50 ₉₄
27.5	58.352 ₂₉	76.94 ₁₂₄	36.909 ₂₇	45.95 ₂₄	24.986 ₂₀	60.56 ₈₁
Oct. 7.5	58.381 ₆₉	75.70 ₁₄₈	36.936 ₆₈	46.19 ₄₈	25.006 ₆₆	59.75 ₆₀
17.5	58.450 ₁₁₄	74.22 ₁₇₁	37.004 ₁₁₂	46.67 ₇₄	25.072 ₁₁₅	59.15 ₃₆
27.4	58.564 ₁₅₉	72.51 ₁₉₃	37.116 ₁₅₉	47.41 ₁₀₀	25.187 ₁₆₅	58.79 ₆
Nov. 6.4	58.723 ₂₀₄	70.58 ₂₁₂	37.275 ₂₀₄	48.41 ₁₂₇	25.352 ₂₁₅	58.73 ₂₇
16.4	58.927 ₂₄₅	68.46 ₂₂₅	37.479 ₂₄₆	49.68 ₁₅₃	25.567 ₂₆₀	59.00 ₆₀
26.4	59.172 ₂₈₁	66.21 ₂₃₄	37.725 ₃₈₂	51.21 ₁₇₄	25.827 ₂₉₉	59.60 ₉₅
Dec. 6.3	59.453 ₃₀₉	63.87 ₂₃₆	38.007 ₃₁₀	52.95 ₁₉₂	26.126 ₃₂₉	60.55 ₁₂₇
16.3	59.762 ₃₂₈	61.51 ₂₃₀	38.317 ₃₂₈	54.87 ₂₀₄	26.455 ₃₅₁	61.82 ₁₅₆
26.3	60.090 ₃₃₇	59.21 ₂₁₇	38.645 ₃₃₇	56.91 ₂₀₉	26.806 ₃₆₀	63.38 ₁₈₂
36.3	60.427	57.04	38.982	59.00	27.166	65.19
Mean Place	56.405	89.56	34.879	32.41	22.953	44.99
Sec δ, Tan δ	1.020	+ 0.200	1.004	— 0.091	1.085	— 0.421
a, a'	+3.0	—19.4	+3.1	—19.2	+3.3	—19.0
b, b'	—0.01	+ 0.3	+0.01	+ 0.3	+0.03	+ 0.3
Authority and Catalogue No.	B.J.	788	B.J.	792	B.J.	802

† First transit, Apr. 11

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	α Centauri		ζ Ursæ Majoris		α Virginis (<i>Spica</i>)	
	2.91	A2	2.40	A2p	1.21	B2
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 13 ^m 16	−30° 22′	^h 13 ^m 21	+55° 15′	^h 13 ^m 21	−10° 49′
Jan. 1.3	56.616	07.88	19.309	27.18	46.506	25.96
11.3	57.018	09.61	19.792	25.48	46.850	27.99
21.2	57.410	11.63	20.277	24.37	47.188	30.04
31.2	57.783	13.87	20.748	23.89	47.511	32.03
Feb. 10.2	58.127	16.27	21.189	24.05	47.810	33.91
20.1	58.436	18.74	21.587	24.80	48.080	35.63
Mar. 2.1	58.706	21.24	21.931	26.13	48.316	37.16
12.1	58.934	23.71	22.213	27.95	48.517	38.47
22.1	59.121	26.10	22.429	30.16	48.681	39.55
Apr. 1.0	59.266	28.37	22.578	32.69	48.810	40.40
11.0	59.371†	30.48	22.658	35.40	48.906	41.03
20.9	59.439	32.41	22.675	38.18	48.971	41.46
30.9	59.473	34.13	22.631	40.95	49.007	41.70
May 10.9	59.475	35.62	22.533	43.58	49.017	41.78
20.9	59.446	36.86	22.388	45.99	49.003	41.71
30.9	59.391	37.84	22.202	48.10	48.969	41.52
June 9.8	59.310	38.53	21.982	49.85	48.915	41.21
19.8	59.208	38.94	21.737	51.18	48.844	40.81
29.8	59.086	39.05	21.471	52.07	48.757	40.31
July 9.8	58.949	38.86	21.194	52.49	48.660	39.76
19.7	58.802	38.39	20.912	52.43	48.553	39.16
29.7	58.650	37.64	20.632	51.88	48.442	38.51
Aug. 8.7	58.498	36.63	20.361	50.86	48.330	37.86
18.7	58.355	35.39	20.107	49.38	48.223	37.21
28.6	58.226	33.98	19.877	47.46	48.127	36.59
Sept. 7.6	58.122	32.43	19.680	45.15	48.047	36.05
17.6	58.050	30.82	19.523	42.48	47.992	35.61
27.5	58.019	29.21	19.415	39.49	47.968	35.32
Oct. 7.5	58.034	27.68	19.362	36.24	47.981	35.21
17.5	58.103	26.30	19.371	32.79	48.035	35.32
27.5	58.228	25.16	19.448	29.20	48.136	35.68
Nov. 6.4	58.410	24.31	19.593	25.57	48.284	36.32
16.4	58.648	23.82	19.811	21.97	48.479	37.24
26.4	58.937	23.72	20.096	18.49	48.718	38.43
Dec. 6.4	59.269	24.04	20.444	15.24	48.995	39.89
16.3	59.635	24.78	20.846	12.30	49.303	41.57
26.3	60.023	25.92	21.289	09.79	49.632	43.42
36.3	60.421	27.43	21.760	07.77	49.972	45.40
Mean Place	56.116	11.64	18.664	51.51	45.897	21.26
Sec δ, Tan δ	1.242	−0.736	1.755	+1.442	1.018	−0.191
a, a'	+3.4	−18.9	+2.4	−18.8	+3.2	−18.8
b, b'	+0.05	+0.3	−0.09	+0.3	+0.01	+0.3
Authority and Catalogue No.	B.J.	803	B.J.	805	B.J.	806

† First transit, Apr. 11

APPARENT PLACES OF STARS, 1935

447

AT UPPER TRANSIT AT GREENWICH

Name	ι Virginis		ζ Virginis		ε Centauri	
	5.59	K2	3.44	A2	2.56	B1
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₃ ^m ₂₃	[°] ₁₂ ['] ₂₂	^h ₁₃ ^m ₃₁	[°] ₀ ['] ₁₅	^h ₁₃ ^m ₃₅	[°] ₅₃ ['] ₀₈
Jan. 1.3	17.461	16.10	23.288	59.53	45.536	03.30
11.3	17.806	18.10	23.624	61.62	46.044	04.48
21.2	18.146	20.14	23.956	63.60	46.546	06.09
31.2	18.471	22.15	24.276	65.43	47.029	08.09
Feb. 10.2	18.772	24.06	24.574	67.02	47.481	10.40
20.1	19.045	25.83	24.845	68.36	47.893	12.97
Mar. 2.1	19.283	27.42	25.084	69.42	48.261	15.73
12.1	19.486	28.80	25.288	70.19	48.578	18.59
22.1	19.653	29.97	25.457	70.67	48.843	21.51
Apr. 1.0	19.785	30.91	25.591	70.88	49.056	24.42
11.0	19.882	31.63	25.690	70.86	49.217	27.27
20.9	19.949	32.15	25.760	70.63	49.328	30.00
30.9	19.986	32.48	25.800	70.24	49.389	32.56
May 10.9	19.998	32.64	25.814	69.72	49.403	34.92
20.9	19.985	32.65	25.805	69.10	49.373	37.02
30.9	19.951	32.52	25.774	68.42	49.300	38.83
June 9.8	19.897	32.27	25.723	67.71	49.188	40.32
19.8	19.827	31.92	25.655	67.00	49.040	41.44
29.8	19.741	31.47	25.571	66.30	48.862	42.17
July 9.8	19.643	30.93	25.475	65.64	48.656	42.51
19.7	19.535	30.33	25.369	65.03	48.432	42.44
29.7	19.423	29.68	25.258	64.48	48.196	41.96
Aug. 8.7	19.310	29.00	25.144	64.03	47.959	41.08
18.7	19.201	28.32	25.034	63.68	47.729	39.82
28.6	19.103	27.65	24.933	63.45	47.518	38.24
Sept. 7.6	19.022	27.05	24.847	63.37	47.339	36.37
17.6	18.966	26.54	24.784	63.47	47.201	34.30
27.5	18.939	26.15	24.749	63.75	47.117	32.09
Oct. 7.5	18.951	25.95	24.749	64.26	47.095	29.84
17.5	19.004	25.97	24.790	65.00	47.144	27.64
27.5	19.104	26.23	24.875	65.99	47.268	25.60
Nov. 6.4	19.251	26.77	25.007	67.23	47.468	23.78
16.4	19.446	27.60	25.185	68.71	47.742	22.31
26.4	19.684	28.71	25.408	70.41	48.085	21.23
Dec. 6.4	19.962	30.08	25.669	72.30	48.488	20.61
16.3	20.271	31.70	25.963	74.32	48.937	20.48
26.3	20.601	33.51	26.280	76.41	49.421	20.85
36.3	20.942	35.45	26.610	78.51	49.922	21.71
Mean Place	16.867	11.91	22.704	51.06	45.355	11.07
Sec δ, Tan δ	1.024	-0.219	1.000	-0.005	1.667	-1.334
a, a'	+3.2	-18.7	+3.1	-18.5	+3.8	-18.3
b, b'	+0.01	+0.4	0.00	+0.4	+0.08	+0.4
Authority and Catalogue No.	N.A.	807	B.J.	814	B.J.	819

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	<i>m</i> Virginis		<i>τ</i> Bootis		<i>η</i> Ursæ Majoris	
Mag. Spect.	5.16	Ma	4.51	F ₅	1.91	B ₃
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 13 ^m 38	[°] — 8 ['] 22	^h 13 ^m 44	[°] +17 ['] 46	^h 13 ^m 44	[°] +49 ['] 37
Jan. 1.3	12.334	37.85	10.856	33.74	59.229	50.96
11.3	12.674	39.85	11.195	31.57	59.659	48.93
21.2	13.011	41.84	11.533	29.68	60.095	47.46
31.2	13.337	43.76	11.863	28.14	60.525	46.58
Feb. 10.2	13.642	45.54	12.173	27.00	60.934	46.33
20.2	13.920	47.14	12.458	26.27	61.311	46.68
Mar. 2.1	14.167	48.52	12.711	25.97	61.644	47.62
12.1	14.380	49.68	12.929	26.08	61.928	49.08
22.1	14.559	50.58	13.111	26.57	62.157	50.99
Apr. 1.0	14.703	51.26	13.255	27.38	62.329	53.26
11.0	14.815	51.73	13.363	28.47	62.443	55.78
20.9	14.897	51.96	13.436	29.75	62.501	58.45
30.9	14.948	52.04	13.478	31.17	62.506	61.16
May 10.9	14.972	51.96	13.490	32.67	62.462	63.82
20.9	14.970	51.75	13.475	34.16	62.374	66.32
30.9	14.948	51.43	13.436	35.61	62.247	68.59
June 9.9	14.903	51.01	13.375	36.96	62.086	70.55
19.8	14.840	50.53	13.294	38.17	61.897	72.15
29.8	14.762	50.01	13.197	39.21	61.684	73.36
July 9.8	14.667	49.43	13.086	40.05	61.455	74.13
19.7	14.561	48.83	12.964	40.66	61.215	74.44
29.7	14.446	48.24	12.835	41.04	60.970	74.29
Aug. 8.7	14.330	47.65	12.703	41.16	60.726	73.67
18.7	14.217	47.07	12.574	41.02	60.491	72.61
28.6	14.113	46.56	12.453	40.62	60.272	71.10
Sept. 7.6	14.021	46.14	12.346	39.93	60.077	69.18
17.6	13.954	45.83	12.261	38.97	59.913	66.87
27.6	13.915	45.68	12.204	37.73	59.789	64.22
Oct. 7.5	13.911	45.70	12.181	36.24	59.712	61.26
17.5	13.950	45.93	12.199	34.47	59.691	58.05
27.5	14.033	46.43	12.262	32.45	59.729	54.65
Nov. 6.4	14.165	47.16	12.372	30.22	59.831	51.13
16.4	14.341	48.17	12.532	27.82	59.998	47.58
26.4	14.566	49.45	12.738	25.30	60.229	44.08
Dec. 6.4	14.827	50.96	12.986	22.71	60.520	40.73
16.3	15.124	52.66	13.270	20.14	60.863	37.63
26.3	15.446	54.52	13.582	17.66	61.249	34.88
36.3	15.778	56.47	13.912	15.36	61.664	32.56
Mean Place	11.808	32.13	10.336	48.30	58.833	73.99
Sec δ, Tan δ	1.011	— 0.147	1.050	+ 0.321	1.544	+ 1.177
<i>a</i> , <i>a'</i>	+3.2	—18.2	+2.9	—18.0	+2.4	—18.0
<i>b</i> , <i>b'</i>	+0.01	+ 0.4	—0.02	+ 0.4	—0.07	+ 0.4
Authority and Catalogue No.	A.E.	821	B.J.	824	B.J.	826

APPARENT PLACES OF STARS, 1935

449

AT UPPER TRANSIT AT GREENWICH

Name	μ Centauri		ζ Centauri		η Bootis	
	3.32	B2p	3.06	B2p	2.80	Go
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 13 45	[°] ['] -42 08	^h ^m 13 51	[°] ['] -46 58	^h ^m 13 51	[°] ['] +18 42
Jan. 1.3	41.777	57.45	28.590	02.47	35.773	67.38
11.3	42.206	58.77	29.048	03.60	36.111	65.16
21.2	42.632	60.43	29.505	05.12	36.451	63.24
31.2	43.045	62.38	29.948	06.08	36.783	61.68
Feb. 10.2	43.434	64.56	30.367	09.12	37.097	60.52
20.2	43.791	66.90	30.753	11.46	37.388	59.79
Mar. 2.1	44.111	69.34	31.101	13.95	37.647	59.50
12.1	44.390	71.82	31.407	16.53	37.873	59.63
22.1	44.627	74.30	31.669	19.14	38.062	60.14
Apr. 1.1	44.822	76.71	31.885	21.73	38.214	60.99
11.0	44.975	79.03	32.057	24.25	38.330	62.11
20.9	45.088	81.22	32.184	26.66	38.412	63.45
30.9	45.161	83.23	32.269	28.92	38.461	64.92
May 10.9	45.197	85.05	32.312	30.99	38.480	66.47
20.9	45.198	86.65	32.315	32.84	38.471	68.03
30.9	45.164	88.00	32.280	34.44	38.437	69.54
June 9.9	45.099	89.07	32.209	35.75	38.380	70.94
19.8	45.004	89.84	32.104	36.75	38.303	72.20
29.8	44.882	90.31	31.968	37.42	38.206	73.29
July 9.8	44.738	90.46	31.807	37.74	38.095	74.17
19.8	44.577	90.29	31.625	37.70	37.973	74.81
29.7	44.403	89.79	31.428	37.30	37.842	75.20
Aug. 8.7	44.225	88.98	31.225	36.55	37.707	75.33
18.7	44.049	87.89	31.025	35.48	37.574	75.19
28.6	43.885	86.55	30.838	34.10	37.447	74.77
Sept. 7.6	43.743	85.00	30.672	32.48	37.335	74.07
17.6	43.632	83.31	30.541	30.67	37.243	73.08
27.6	43.561	81.54	30.454	28.74	37.178	71.81
Oct. 7.5	43.540	79.77	30.419	26.77	37.148	70.26
17.5	43.575	78.08	30.446	24.85	37.158	68.44
27.5	43.671	76.55	30.539	23.07	37.213	66.38
Nov. 6.5	43.830	75.27	30.700	21.51	37.316	64.11
16.4	44.053	74.30	30.930	20.25	37.469	61.65
26.4	44.334	73.69	31.223	19.35	37.668	59.08
Dec. 6.4	44.666	73.49	31.572	18.87	37.911	56.44
16.3	45.040	73.72	31.967	18.83	38.191	53.82
26.3	45.445	74.37	32.396	19.24	38.501	51.30
36.3	45.867	75.43	32.846	20.10	38.829	48.95
Mean Place	41.498	62.23	28.405	08.36	35.302	82.21
Sec δ , Tan δ	1.349	-0.905	1.465	-1.071	1.056	+0.339
a, a'	+3.6	-18.0	+3.7	-17.7	+2.9	-17.7
b, b'	+0.05	+0.4	+0.06	+0.5	-0.02	+0.5
Authority and Catalogue No.	A.N.	828	B.J.	831	B.J.	834

† Second transit, Apr. 20

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	τ Virginis		β Centauri		α Draconis	
Mag. Spect.	4.34	A2	0.86	B1	3.64	A0p
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₃ ^m ₅₈	+ [°] ₁ ['] ₅₁	^h ₁₃ ^m ₅₉	- [°] ₆₀ ['] ₀₃	^h ₁₄ ^m ₀₂	+ [°] ₆₄ ['] ₄₀
Jan. 1.3	20.578	20.93	12.91	28.70	37.47	44.54
11.3	20.909 ³³¹	18.84 ²⁰⁹	13.50 ⁵⁹	29.38 ⁶⁸	37.47 ⁵⁷	44.54 ²¹
21.2	21.242 ³³³	16.88 ¹⁹⁶	14.09 ⁵⁹	30.55 ¹¹⁷	38.04 ⁶⁰	42.53 ¹
31.2	21.567 ³⁴⁵	15.10 ¹⁷⁸	14.67 ⁵⁸	32.16 ¹⁶¹	38.64 ⁵⁹	41.14 ¹
Feb. 10.2	21.875 ³⁰⁸	13.56 ¹⁵⁴	15.22 ⁵⁵	34.17 ²⁰¹	39.23 ⁵⁸	40.41 ¹
	21.875 ²⁸⁶	13.56 ¹²⁶	15.22 ⁵¹	34.17 ²³⁴	39.81 ⁵⁴	40.34 ¹
20.2	22.161	12.30	15.73	36.51	40.35	40.94
Mar. 2.1	22.418 ²⁵⁷	11.34 ⁶⁵	16.20 ⁴⁷	39.11 ²⁶⁰	40.84 ⁴⁹	42.16 ¹
12.1	22.644 ²²⁶	10.69 ⁹⁶	16.61 ⁴¹	41.91 ²⁸⁰	41.26 ⁴²	43.94 ¹
22.1	22.837 ¹⁹³	10.34 ³⁵	16.96 ³⁵	44.85 ²⁹⁴	41.60 ³⁴	46.19 ²
Apr. 1.1	22.996 ¹⁵⁹	10.28 ⁶	17.26 ³⁰	47.85 ³⁰⁰	41.86 ²⁶	48.82 ²
	22.996 ¹²⁷	10.28 ¹⁹	17.26 ²³	47.85 ³⁰⁰	41.86 ¹⁷	48.82 ²
11.0	23.123	10.47	17.49	50.85	42.03	51.72
21.0	23.219 ⁹⁶	10.87 ⁴⁰	17.66 ¹⁷	53.80 ²⁹⁵	42.11 ⁸	54.76 ³
30.9	23.285 ⁶⁶	11.44 ⁵⁷	17.77 ¹¹	56.65 ²⁸⁵	42.10 ¹	57.82 ³
May 10.9	23.323 ³⁸	12.13 ⁶⁹	17.83 ⁶	59.34 ²⁶⁹	42.02 ⁸	60.81 ²
20.9	23.336 ¹³	12.92 ⁷⁹	17.82 ¹	61.82 ²⁴⁸	41.85 ¹⁷	63.61 ²
	23.336 ¹²	12.92 ⁸³	17.82 ⁶	61.82 ²²¹	41.85 ²³	63.61 ²
30.9	23.324	13.75	17.76	64.03	41.62	66.14
June 9.9	23.290 ³⁴	14.59 ⁸⁴	17.64 ¹²	65.94 ¹⁹¹	41.34 ²⁸	68.32 ²¹
19.8	23.235 ⁵⁵	15.43 ⁸⁰	17.48 ¹⁶	67.49 ¹⁵⁵	41.00 ³⁴	70.09 ¹
29.8	23.159 ⁷⁶	16.23 ⁸⁰	17.27 ²¹	68.65 ¹¹⁶	40.62 ³⁸	71.41 ¹
July 9.8	23.068 ⁹¹	16.96 ⁷³	17.02 ²⁵	69.40 ⁷⁵	40.21 ⁴¹	72.22 ¹
	23.068 ¹⁰⁴	16.96 ⁶⁵	17.02 ²⁸	69.40 ³¹	40.21 ⁴²	72.22 ¹
19.8	22.964	17.61	16.74	69.71	39.79	72.53
29.7	22.849 ¹¹⁵	18.17 ⁵⁶	16.44 ³⁰	69.56 ¹⁵	39.35 ⁴⁴	72.31 ¹
Aug. 8.7	22.728 ¹²¹	18.61 ⁴⁴	16.13 ³¹	68.97 ⁵⁹	38.92 ⁴³	71.57 ¹
18.7	22.607 ¹²¹	18.93 ³²	15.83 ³⁰	67.95 ¹⁰²	38.49 ⁴³	70.33 ¹
28.6	22.491 ¹¹⁶	19.10 ¹⁷	15.54 ²⁹	66.53 ¹⁴²	38.09 ⁴⁰	68.60 ¹
	22.491 ¹⁰⁴	19.10 ¹	15.54 ²⁵	66.53 ¹⁷⁸	38.09 ³⁶	68.60 ²¹
Sept. 7.6	22.387	19.11	15.29	64.75	37.73	66.42
17.6	22.301 ⁸⁶	18.93 ¹⁸	15.08 ²¹	62.68 ²⁰⁷	37.41 ³²	63.82 ²
27.6	22.242 ⁵⁹	18.56 ³⁷	14.93 ¹⁵	60.38 ²³⁰	37.14 ²⁷	60.86 ²
Oct. 7.5	22.216 ²⁶	17.97 ⁵⁹	14.85 ⁸	57.95 ²⁴³	36.95 ¹⁹	57.59 ³
17.5	22.230 ¹⁴	17.14 ⁸³	14.85 [—]	55.50 ²⁴⁵	36.83 ¹²	54.06 ³
	22.230 ⁵⁸	17.14 ¹⁰⁷	14.85 ¹⁰	55.50 ²³⁹	36.83 ³	54.06 ³⁷
27.5	22.288	16.07	14.95	53.11	36.80	50.36
Nov. 6.5	22.392 ¹⁰⁴	14.76 ¹³¹	15.13 ¹⁸	50.90 ²²¹	36.86 ⁶	46.56 ³
16.4	22.545 ¹⁵³	13.21 ¹⁵⁵	15.41 ²⁸	48.96 ¹⁹⁴	37.01 ¹⁵	42.75 ³
26.4	22.744 ¹⁹⁹	11.46 ¹⁷⁵	15.77 ³⁶	47.37 ¹⁵⁹	37.25 ²⁴	39.04 ³⁷
Dec. 6.4	22.985 ²⁴¹	09.53 ¹⁹³	16.21 ⁴⁴	46.21 ¹¹⁶	37.59 ³⁴	35.52 ³⁵
	22.985 ²⁷⁶	09.53 ²⁰⁴	16.21 ⁵⁰	46.21 ⁶⁸	37.59 ⁴²	35.52 ³²
16.3	23.261	07.49	16.71	45.53	38.01	32.30
26.3	23.566 ³⁰⁵	05.38 ²¹¹	17.26 ⁵⁵	45.36 ¹⁷	38.50 ⁴⁹	29.48 ²
36.3	23.888 ³²²	03.28 ²¹⁰	17.83 ⁵⁷	45.70 ³⁴	39.04 ⁵⁴	27.15 ²³
Mean Place	20.144	30.27	13.071	37.23	37.621	69.65
Secs, Tan δ	1.001	+ 0.032	2.004	- 1.736	2.339	+ 2.114
a, a'	+3.1	-17.4	+4.2	-17.4	+1.6	-17.2
b, b'	0.00	+ 0.5	+0.10	+ 0.5	-0.12	+ 0.5
Authority and Catalogue No.	B.J.	839	B.J.	841	B.J.	845

APPARENT PLACES OF STARS, 1935

451

AT UPPER TRANSIT AT GREENWICH

Name	π Hydræ		θ Centauri		94 Virginis	
Mag. Spect.	3.48	Ko	2.26	Ko	6.56	Ao
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 14 02	[°] ['] -26 22	^h ^m 14 02	[°] ['] -36 03	^h ^m 14 02	[°] ['] -8 34
Jan. 1.3	40.119 40.486 ³⁶⁷	11.67 13.21 ¹⁵⁴	51.211 51.609 ³⁹⁸	00.89 02.20 ¹³¹	51.412 51.749 ³³⁷	60.99 62.89 ¹⁹⁰
11.3	40.855 ³⁶⁹	14.94 ¹⁷³	52.008 ³⁹⁹	03.79 ¹⁵⁹	52.087 ³³⁸	64.80 ¹⁹¹
21.3	41.215 ³⁶⁰	16.79 ¹⁸⁵	52.398 ³⁹⁰	05.62 ¹⁸³	52.418 ³³¹	66.64 ¹⁸⁴
31.2	41.557 ³⁴²	18.72 ¹⁹³	52.769 ³⁷¹	07.61 ¹⁹⁹	52.733 ³¹⁵	68.35 ¹⁷¹
Feb. 10.2	41.875 ³¹⁸	20.66 ¹⁹⁴	53.113 ³⁴⁴	09.72 ²¹¹	53.025 ²⁹²	69.89 ¹⁵⁴
20.2	42.163 ²⁸⁸	22.57 ¹⁹¹	53.425 ³¹²	11.90 ²¹⁸	53.289 ²⁶⁴	71.23 ¹³⁴
Mar. 2.1	42.418 ²⁵⁵	24.40 ¹⁸³	53.702 ²⁷⁷	14.08 ²¹⁸	53.524 ²³⁵	72.34 ¹¹¹
12.1	42.639 ²²¹	26.12 ¹⁷²	53.941 ²³⁹	16.22 ²¹⁴	53.725 ²⁰¹	73.20 ⁸⁶
22.1	42.825 ¹⁸⁶	27.71 ¹⁵⁹	54.143 ²⁰²	18.28 ²⁰⁶	53.893 ¹⁶⁸	73.84 ⁶⁴
Apr. 1.1	42.977 ¹⁵²	29.15 ¹⁴⁴	54.307 ¹⁶⁴	20.23 ¹⁹⁵	54.030 ¹³⁷	74.26 ⁴²
11.0	43.095 ¹¹⁸	30.43 ¹²⁸	54.435 ¹²⁸	22.06 ¹⁸³	54.135 ¹⁰⁵	74.48 ²²
21.0	43.181 ⁸⁶	31.54 ¹¹¹	54.527 ⁹²	23.74 ¹⁶⁸	54.211 ⁷⁶	74.52 ⁴
30.9	43.236 ⁵⁵	32.48 ⁹⁴	54.584 ⁵⁷	25.24 ¹⁵⁰	54.259 ⁴⁸	74.41 ¹¹
May 10.9	43.262 ²⁶	33.25 ⁷⁷	54.608 ²⁴	26.56 ¹³²	54.281 ²²	74.17 ²⁴
20.9	43.259 ³	33.84 ⁵⁹	54.599 ⁹	27.66 ¹¹⁰	54.278 ³	73.83 ³⁴
30.9	43.230 ²⁹	34.25 ⁴¹	54.560 ³⁹	28.53 ⁸⁷	54.251 ²⁷	73.42 ⁴¹
June 9.9	43.176 ⁵⁴	34.47 ²²	54.491 ⁶⁹	29.17 ⁶⁴	54.202 ⁴⁹	72.94 ⁴⁸
19.8	43.097 ⁷⁹	34.51 ⁴	54.397 ⁹⁴	29.56 ³⁹	54.133 ⁶⁹	72.42 ⁵²
29.8	42.997 ¹⁰⁰	34.36 ¹⁵	54.278 ¹¹⁹	29.68 ¹²	54.045 ⁸⁸	71.86 ⁵⁶
July 9.8	42.880 ¹¹⁷	34.03 ³³	54.139 ¹³⁹	29.53 ¹⁵	53.942 ¹⁰³	71.29 ⁵⁷
19.8	42.750 ¹³⁰	33.53 ⁵⁰	53.986 ¹⁵³	29.12 ⁴¹	53.829 ¹¹³	70.71 ⁵⁸
29.7	42.612 ¹³⁸	32.86 ⁶⁷	53.823 ¹⁶³	28.45 ⁶⁷	53.708 ¹²¹	70.15 ⁵⁶
Aug. 8.7	42.473 ¹³⁹	32.05 ⁸¹	53.660 ¹⁶³	27.56 ⁸⁹	53.585 ¹²³	69.61 ⁵⁴
18.7	42.339 ¹³⁴	31.13 ⁹²	53.504 ¹⁵⁶	26.45 ¹¹¹	53.467 ¹¹⁸	69.12 ⁴⁹
28.7	42.219 ¹²⁰	30.12 ¹⁰¹	53.364 ¹⁴⁰	25.18 ¹²⁷	53.360 ¹⁰⁷	68.72 ⁴⁰
Sept. 7.6	42.121 ⁹⁸	29.07 ¹⁰⁵	53.250 ¹¹⁴	23.79 ¹³⁹	53.272 ⁸⁸	68.42 ³⁰
17.6	42.053 ⁶⁸	28.04 ¹⁰³	53.170 ⁸⁰	22.34 ¹⁴⁵	53.211 ⁶¹	68.24 ¹⁸
27.6	42.024 ²⁹	27.08 ⁹⁶	53.133 ³⁷	20.89 ¹⁴⁵	53.184 ²⁷	68.24 [—]
Oct. 7.5	42.040 ¹⁶	26.24 ⁸⁴	53.147 ¹⁴	19.53 ¹³⁶	53.197 ¹³	68.44 ²⁰
17.5	42.106 ⁶⁶	25.58 ⁶⁶	53.217 ⁷⁰	18.33 ¹²⁰	53.255 ⁵⁸	68.86 ⁴²
27.5	42.226 ¹²⁰	25.15 ⁴³	53.346 ¹²⁹	17.34 ⁹⁹	53.362 ¹⁰⁷	69.53 ⁶⁷
Nov. 6.5	42.400 ¹⁷⁴	25.01 ¹⁴	53.535 ¹⁸⁹	16.64 ⁷⁰	53.517 ¹⁵⁵	70.45 ⁹²
16.4	42.626 ²²⁶	25.17 ¹⁶	53.779 ²⁴⁴	16.27 ³⁷	53.718 ²⁰¹	71.62 ¹¹⁷
26.4	42.898 ²⁷²	25.65 ⁴⁸	54.074 ²⁹⁵	16.25 ²	53.964 ²⁴⁶	73.02 ¹⁴⁰
Dec. 6.4	43.208 ³¹⁰	26.46 ⁸¹	54.410 ³³⁶	16.62 ³⁷	54.245 ²⁸¹	74.63 ¹⁶¹
16.4	43.548 ³⁴⁰	27.57 ¹¹¹	54.779 ³⁶⁹	17.35 ⁷³	54.554 ³⁰⁹	76.39 ¹⁷⁶
26.3	43.908 ³⁶⁰	28.94 ¹³⁷	55.167 ³⁸⁸	18.44 ¹⁰⁹	54.882 ³²⁸	78.24 ¹⁸⁵
36.3						
Mean Place	39.797	11.51	50.961	03.59	51.020	55.10
Sec δ, Tan δ	1.116	-0.496	1.237	-0.728	1.011	-0.151
a, a'	+3.4	-17.2	+3.6	-17.2	+3.2	-17.2
b, b'	+0.03	+0.5	+0.04	+0.5	+0.01	+0.5
Authority and Catalogue No.	A.N.	842	B.J.	843	N.A.	844

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	κ Virginis		α Bootis (<i>Arcturus</i>)		2 Libræ	
	4.31 Ko		0.24 Ko		6.30 Ko	
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
Mean Solar Date						
	^h 14 09	^m — 9 58	^h 14 12	^m +19 30	^h 14 19	^m —11 25
Jan. 1.3	25.806 ³³⁶	24.63 ¹⁸⁶	42.029 ³³⁰	57.46 ²³⁴	55.786 ³³⁶	10.07 ¹⁷⁹
11.3	26.142 ³⁴⁰	26.49 ¹⁸⁶	42.359 ³³⁶	55.12 ²⁰³	56.122 ³⁴¹	11.86 ¹⁸³
21.3	26.482 ³³³	28.35 ¹⁸²	42.695 ³³³	53.09 ¹⁶⁸	56.463 ³³⁶	13.69 ¹⁷⁸
31.2	26.815 ³¹⁸	30.17 ¹⁷¹	43.028 ³¹⁹	51.41 ¹²⁶	56.799 ³²³	15.47 ¹⁶⁷
Feb. 10.2	27.133 ²⁹⁶	31.88 ¹⁵⁵	43.347 ²⁹⁸	50.15 ⁸³	57.122 ³⁰¹	17.14 ¹⁵⁷
20.2	27.429 ²⁷⁰	33.43 ¹³⁶	43.645 ²⁷²	49.32 ³⁸	57.423 ²⁷⁸	18.71 ¹³⁶
Mar. 2.1	27.699 ²³⁹	34.79 ¹¹⁵	43.917 ²³⁹	48.94 ⁷	57.701 ²⁴⁸	20.07 ¹¹⁹
12.1	27.938 ²⁰⁷	35.94 ⁹²	44.156 ²⁰⁶	49.01 ⁴⁶	57.949 ²¹⁷	21.26 ⁹⁶
22.1	28.145 ¹⁷⁶	36.86 ⁶⁹	44.362 ¹⁷⁰	49.47 ⁸³	58.166 ¹⁸⁶	22.22 ⁷⁴
Apr. 1.1	28.321 ¹⁴⁴	37.55 ⁴⁸	44.532 ¹³⁶	50.30 ¹¹³	58.352 ¹⁵⁵	22.96 ⁵⁴
11.0	28.465 ¹¹³	38.03 ²⁸	44.668 ¹⁰⁰	51.43 ¹³⁶	58.507 ¹²⁵	23.50 ³⁵
21.0	28.578 ⁸⁴	38.31 ¹⁰	44.768 ⁶⁸	52.79 ¹⁵²	58.632 ⁹⁵	23.85 ¹⁷
30.9	28.662 ⁵⁵	38.41 ⁴	44.836 ³⁶	54.31 ¹⁶¹	58.727 ⁶⁶	24.02 ³
May 10.9	28.717 ²⁹	38.37 ¹⁷	44.872 ⁷	55.92 ¹⁶³	58.793 ³⁹	24.05 ¹¹
20.9	28.746 ³	38.20 ²⁸	44.879 ²⁰	57.55 ¹⁵⁹	58.832 ¹³	23.94 ²⁰
30.9	28.749 ²²	37.92 ³⁶	44.859 ⁴⁶	59.14 ¹⁵⁰	58.845 ¹⁵	23.74 ³⁰
June 9.9	28.727 ⁴⁴	37.56 ⁴³	44.813 ⁶⁹	60.64 ¹³⁵	58.830 ³⁷	23.44 ³⁷
19.8	28.683 ⁶⁷	37.13 ⁴⁹	44.744 ⁹²	61.99 ¹¹⁷	58.793 ⁶¹	23.07 ⁴²
29.8	28.616 ⁸⁶	36.64 ⁵²	44.652 ¹⁰⁹	63.16 ⁹⁶	58.732 ⁸¹	22.65 ⁵⁰
July 9.8	28.530 ¹⁰²	36.12 ⁵⁵	44.543 ¹²⁵	64.12 ⁷²	58.651 ¹⁰¹	22.15 ⁵¹
19.8	28.428 ¹¹⁴	35.57 ⁵⁷	44.418 ¹³⁶	64.84 ⁴⁶	58.550 ¹¹³	21.64 ⁵³
29.7	28.314 ¹²³	35.00 ⁵⁸	44.282 ¹⁴⁴	65.30 ¹⁹	58.437 ¹²⁶	21.11 ⁵⁶
Aug. 8.7	28.191 ¹²⁶	34.42 ⁵⁵	44.138 ¹⁴⁶	65.49 ¹⁰	58.311 ¹²⁸	20.55 ⁵⁵
18.7	28.065 ¹²²	33.87 ⁵²	43.992 ¹⁴²	65.39 ³⁹	58.183 ¹³⁰	20.00 ⁵⁴
28.7	27.943 ¹¹¹	33.35 ⁴⁶	43.850 ¹³¹	65.00 ⁶⁸	58.053 ¹¹⁶	19.46 ⁴⁹
Sept. 7.6	27.832 ⁹³	32.89 ³⁶	43.719 ¹¹²	64.32 ⁹⁸	57.937 ¹⁰²	18.97 ⁴¹
17.6	27.739 ⁶⁶	32.53 ²⁴	43.607 ⁸⁷	63.34 ¹²⁸	57.835 ⁷⁴	18.56 ²⁹
27.6	27.673 ³⁴	32.29 ⁹	43.520 ⁵⁵	62.06 ¹⁵⁶	57.761 ⁴²	18.27 ¹⁶
Oct. 7.5	27.639 ⁸	32.20 ¹¹	43.465 ¹⁵	60.50 ¹⁸⁵	57.719 ³	18.11 ²
17.5	27.647 ⁵²	32.31 ³²	43.450 ²⁹	58.65 ²¹⁰	57.716 ⁴²	18.13 ²²
27.5	27.699 ¹⁰¹	32.63 ⁵⁶	43.479 ⁷⁸	56.55 ²³²	57.758 ⁹²	18.35 ⁴⁵
Nov. 6.5	27.800 ¹⁵⁰	33.19 ⁸²	43.557 ¹²⁷	54.23 ²⁵²	57.850 ¹⁴⁰	18.80 ⁷⁰
16.4	27.950 ¹⁹⁸	34.01 ¹⁰⁷	43.684 ¹⁷⁸	51.71 ²⁶⁵	57.990 ¹⁸⁹	19.50 ⁹⁵
26.4	28.148 ²⁴²	35.08 ¹³¹	43.862 ²²²	49.06 ²⁷¹	58.179 ²³⁵	20.45 ¹²⁰
Dec. 6.4	28.390 ²⁷⁹	36.39 ¹⁵¹	44.084 ²⁶³	46.35 ²⁷²	58.414 ²⁷⁴	21.65 ¹⁴¹
16.4	28.669 ³⁰⁷	37.90 ¹⁶⁹	44.347 ²⁹⁵	43.63 ²⁶³	58.688 ³⁰⁴	23.06 ¹⁵⁸
26.3	28.976 ³²⁸	39.59 ¹⁷⁹	44.642 ³¹⁷	41.00 ²⁴⁵	58.992 ³²⁵	24.64 ¹⁷²
36.3	29.304	41.38	44.959	38.55	59.317	26.36
Mean Place	25.449	19.14	41.698	72.38	55.487	04.96
Sec δ , Tan δ	1.015	— 0.176	1.061	+ 0.355	1.020	— 0.202
a, a'	+3.2	—16.9	+2.8	—16.8	+3.2	—16.4
b, b'	+0.01	+ 0.5	—0.02	+ 0.5	+0.01	+ 0.6
Authority and Catalogue No.	B.J.	849	B.J.	852	A.E.	860

APPARENT PLACES OF STARS, 1935

453

AT UPPER TRANSIT AT GREENWICH

Name	<i>f</i> Bootis		<i>ρ</i> Bootis		<i>γ</i> Bootis	
Mag. Spect.	5.36	A5	3.78	Ko	3.00	Fo
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 14 23	^h ^m ^s +19 30	^h ^m 14 29	^h ^m ^s +30 38	^h ^m 14 29	^h ^m ^s +38 34
Jan. 1.3	26.104 ³²⁸	51.04 ²³²	01.803 ³⁴⁰	63.50 ²⁴²	27.671 ³⁵⁸	70.93 ²⁴⁴
11.3	26.432 ³³⁶	48.72 ²⁰²	02.143 ³⁵²	61.08 ²⁰³	28.029 ³⁷²	68.49 ²⁰⁰
21.3	26.768 ³³⁴	46.70 ¹⁶⁶	02.495 ³⁵²	59.05 ¹⁵⁷	28.401 ³⁷⁵	66.49 ¹⁴⁹
31.2	27.102 ³²³	45.04 ¹²³	02.847 ³⁴³	57.48 ¹⁰⁸	28.776 ³⁶⁶	65.00 ⁹²
Feb. 10.2	27.425 ³⁰⁴	43.81 ⁸³	03.190 ³²⁵	56.40 ⁵⁵	29.142 ³⁴⁷	64.08 ³⁴
20.2	27.729 ²⁸⁰	42.98 ³⁵	03.515 ²⁹⁹	55.85 ¹	29.489 ³²⁰	63.74 ²³
Mar. 2.2	28.009 ²⁴⁸	42.63 ⁹	03.814 ²⁶⁸	55.84 ⁵⁰	29.809 ²⁸⁶	63.97 ⁷⁸
12.1	28.257 ²¹⁷	42.72 ⁴⁹	04.082 ²³²	56.34 ⁹⁷	30.095 ²⁴⁷	64.75 ¹²⁸
22.1	28.474 ¹⁸³	43.21 ⁸⁷	04.314 ¹⁹⁴	57.31 ¹³⁸	30.342 ²⁰⁵	66.03 ¹⁷⁰
Apr. 1.1	28.657 ¹⁴⁸	44.08 ¹¹⁹	04.508 ¹⁵⁶	58.69 ¹⁷¹	30.547 ¹⁶²	67.73 ²⁰⁶
11.1	28.805 ¹¹⁴	45.27 ¹⁴¹	04.664 ¹¹⁷	60.40 ¹⁹⁷	30.709 ¹¹⁸	69.79 ²³⁰
21.0	28.919 ⁷⁹	46.68 ¹⁶¹	04.781 ⁸⁰	62.37 ²¹⁴	30.827 ⁷⁵	72.09 ²⁴⁵
30.9	28.998 ⁵⁰	48.29 ¹⁷¹	04.861 ⁴⁴	64.51 ²²¹	30.902 ³⁵	74.54 ²⁵²
May 10.9	29.048 ¹⁸	50.00 ¹⁷²	04.905 ¹⁰	66.72 ²²¹	30.937 ⁵	77.06 ²⁴⁹
20.9	29.066 ⁹	51.72 ¹⁷⁰	04.915 ²³	68.93 ²¹⁴	30.932 ⁴⁰	79.55 ²³⁷
30.9	29.057 ³⁸	53.42 ¹⁶⁰	04.892 ⁵⁴	71.07 ¹⁹⁸	30.892 ⁷⁵	81.92 ²¹⁸
June 9.9	29.019 ⁶⁰	55.02 ¹⁴⁷	04.838 ⁸¹	73.05 ¹⁷⁸	30.817 ¹⁰⁵	84.10 ¹⁹³
19.9	28.959 ⁸⁴	56.49 ¹²⁹	04.757 ¹⁰⁷	74.83 ¹⁵³	30.712 ¹³⁴	86.03 ¹⁶⁴
29.8	28.875 ¹⁰⁵	57.78 ¹⁰⁸	04.650 ¹²⁹	76.36 ¹²³	30.578 ¹⁵⁷	87.67 ¹²⁸
July 9.8	28.770 ¹²¹	58.86 ⁸³	04.521 ¹⁴⁷	77.59 ⁹⁰	30.421 ¹⁷⁶	88.95 ⁹⁰
19.8	28.649 ¹³⁴	59.69 ⁵⁹	04.374 ¹⁶²	78.49 ⁵⁶	30.245 ¹⁹¹	89.85 ⁵⁰
29.8	28.515 ¹⁴⁴	60.28 ³¹	04.212 ¹⁷¹	79.05 ²⁰	30.054 ²⁰¹	90.35 ⁸
Aug. 8.7	28.371 ¹⁴⁸	60.59 [—]	04.041 ¹⁷⁵	79.25 ¹⁷	29.853 ²⁰³	90.43 ³³
18.7	28.223 ¹⁴⁶	60.59 ²⁸	03.866 ¹⁷²	79.08 ⁵⁴	29.650 ²⁰⁰	90.10 ⁷⁵
28.7	28.077 ¹³⁵	60.31 ⁵⁵	03.694 ¹⁶³	78.54 ⁹²	29.450 ¹⁸⁸	89.35 ¹¹⁷
Sept. 7.6	27.942 ¹²¹	59.76 ⁸⁹	03.531 ¹⁴⁴	77.62 ¹²⁸	29.262 ¹⁶⁸	88.18 ¹⁵⁶
17.6	27.821 ⁹⁵	58.87 ¹¹⁶	03.387 ¹²⁰	76.34 ¹⁶³	29.094 ¹⁴¹	86.62 ¹⁹⁴
27.6	27.726 ⁶¹	57.71 ¹⁴⁸	03.267 ⁸⁵	74.71 ¹⁹⁶	28.953 ¹⁰⁵	84.68 ²²⁹
Oct. 7.6	27.665 ²⁴	56.23 ¹⁷⁵	03.182 ⁴⁶	72.75 ²²⁷	28.848 ⁶¹	82.39 ²⁶⁰
17.5	27.641 ¹⁸	54.48 ²⁰³	03.136 ²	70.48 ²⁵⁴	28.787 ¹¹	79.79 ²⁸⁸
27.5	27.659 ⁶⁷	52.45 ²²⁴	03.138 ⁵³	67.94 ²⁷⁷	28.776 ⁴⁵	76.91 ³⁰⁹
Nov. 6.5	27.726 ¹¹⁹	50.21 ²⁴⁴	03.191 ¹⁰⁶	65.17 ²⁹⁴	28.821 ¹⁰²	73.82 ³²⁴
16.5	27.845 ¹⁶⁸	47.77 ²⁵⁹	03.297 ¹⁶⁰	62.23 ³⁰⁴	28.923 ¹⁵⁹	70.58 ³³¹
26.4	28.013 ²¹⁶	45.18 ²⁶⁴	03.457 ²¹¹	59.19 ³⁰⁶	29.082 ²¹⁵	67.27 ³²⁹
Dec. 6.4	28.229 ²⁵⁶	42.54 ²⁶⁸	03.668 ²⁵⁷	56.13 ³⁰⁰	29.297 ²⁶⁵	63.98 ³¹⁸
16.4	28.485 ²⁹⁰	39.86 ²⁵⁸	03.925 ²⁹⁵	53.13 ²⁸⁵	29.562 ³⁰⁸	60.80 ²⁹⁷
26.3	28.775 ³¹⁵	37.28 ²⁴⁴	04.220 ³²⁴	50.28 ²⁵⁹	29.870 ³⁴⁰	57.83 ²⁶⁶
36.3	29.090	34.84	04.544	47.69	30.210	55.17
Mean Place	25.842	65.84	01.643	81.28	27.590	90.64
Sec δ, Tan δ	1.061	+ 0.354	1.162	+ 0.593	1.279	+ 0.798
<i>a</i> , <i>a'</i>	+2.8	-16.2	+2.6	-16.0	+2.4	-15.9
<i>b</i> , <i>b'</i>	-0.02	+ 0.6	-0.03	+ 0.6	-0.04	+ 0.6
Authority and Catalogue No.	A.E.	863	B.J.	869	B.J.	870

† Second transit, Apr. 30

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	η Centauri		α^2 Centauri		α Circini	
Mag. Spect.	2.65	B ₃ p—A ₂ p	0.33	Go—K ₅	3.42	Fo
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 14 31	[°] ['] —41 52	^h ^m 14 35	[°] ['] —60 33	^h ^m 14 37	[°] ['] —64 41
Jan. 1.3	22.255 ⁴²⁰	20.41 ⁸³	09.92	58.65 ²⁶	13.18 ⁶⁶	29.01 ¹
11.3	22.675 ⁴²⁷	21.24 ¹¹⁶	10.51 ⁵⁹	58.91 ⁷⁴	13.84 ⁶⁸	29.02 ⁵¹
21.3	23.102 ⁴²⁴	22.40 ¹⁴⁵	11.10 ⁵⁹	59.65 ¹¹⁸	14.52 ⁶⁸	29.53 ¹⁰⁰
31.2	23.526 ⁴¹⁰	23.85 ¹⁶⁹	11.69 ⁵⁷	60.83 ¹⁵⁹	15.20 ⁶⁶	30.53 ¹⁴⁴
Feb. 10.2	23.936 ³⁸⁹	25.54 ¹⁸⁹	12.26 ⁵⁴	62.42 ¹⁹⁵	15.86 ⁶³	31.97 ¹⁸³
20.2	24.325 ³⁶⁰	27.43 ²⁰¹	12.80	64.37 ²²⁴	16.49 ⁵⁹	33.80 ²¹⁷
Mar. 2.2	24.685 ³²⁷	29.44 ²¹⁰	13.29 ⁴⁶	66.61 ²⁴⁷	17.08 ⁵⁴	35.97 ²⁴⁵
12.1	25.012 ²⁹¹	31.54 ²¹⁴	13.75 ³⁹	69.08 ²⁶⁴	17.62 ⁴⁸	38.42 ²⁶⁶
22.1	25.303 ²⁵³	33.68 ²¹³	14.14 ³⁴	71.72 ²⁷⁵	18.10 ⁴²	41.08 ²⁸³
Apr. 1.1	25.556 ²¹⁴	35.81 ²⁰⁹	14.48 ²⁸	74.47 ²⁸¹	18.52 ³⁵	43.91 ²⁹²
11.1	25.770 ¹⁷⁶	37.90 ²⁰¹	14.76 ²²	77.28 ²⁸¹	18.87 ²⁹	46.83 ²⁹⁶
21.0	25.946 ¹³⁷	39.91 ¹⁹¹	14.98 ¹⁶	80.09 ²⁷⁶	19.16 ²¹	49.79 ²⁹⁴
May 1.0	26.083 ⁹⁹	41.82 ¹⁷⁸	15.14 ¹⁰	82.85 ²⁶⁴	19.37 ¹⁴	52.73 ²⁸⁶
10.9	26.182 ⁵⁹	43.60 ¹⁶²	15.24 ⁴	85.49 ²⁴⁹	19.51 ⁷	55.59 ²⁷²
20.9	26.241 ²²	45.22 ¹⁴³	15.28 ³	87.98 ²²⁷	19.58 ¹	58.31 ²⁵³
30.9	26.263 ¹⁶	46.65 ¹²³	15.25	90.25 ²⁰²	19.57 ⁷	60.84 ²²⁸
June 9.9	26.247 ⁵²	47.88 ⁹⁹	15.16 ¹⁴	92.27 ¹⁷¹	19.50 ¹⁴	63.12 ¹⁹⁸
19.9	26.195 ⁸⁷	48.87 ⁷²	15.02 ¹⁹	93.98 ¹³⁷	19.36 ²¹	65.10 ¹⁶⁴
29.8	26.108 ¹¹⁹	49.59 ⁴⁶	14.83 ²⁴	95.35 ⁹⁹	19.15 ²⁷	66.74 ¹²⁴
July 9.8	25.989 ¹⁴⁵	50.05 ¹⁷	14.59 ²⁸	96.34 ⁵⁸	18.88 ³¹	67.98 ⁸²
19.8	25.844 ¹⁶⁷	50.22 ¹⁴	14.31 ³¹	96.92 ¹⁶	18.57 ³⁵	68.80 ³⁷
29.8	25.677 ¹⁸²	50.08 ⁴³	14.00 ³³	97.08 ²⁹	18.22 ³⁷	69.17 ¹⁰
Aug. 8.7	25.495 ¹⁸⁹	49.65 ⁷²	13.67 ³⁴	96.79 ⁷²	17.85 ³⁸	69.07 ⁵⁷
18.7	25.306 ¹⁸⁸	48.93 ⁹⁹	13.33 ³²	96.07 ¹¹⁴	17.47 ³⁸	68.50 ¹⁰²
28.7	25.118 ¹⁷⁵	47.94 ¹²³	13.01 ³⁰	94.93 ¹⁵³	17.09 ³⁵	67.48 ¹⁴⁴
Sept. 7.6	24.943 ¹⁵²	46.71 ¹⁴²	12.71 ²⁷	93.40 ¹⁸⁶	16.74 ³¹	66.04 ¹⁸²
17.6	24.791 ¹¹⁸	45.29 ¹⁵⁶	12.44 ²¹	91.54 ²¹²	16.43 ²⁵	64.22 ²¹⁴
27.6	24.673 ⁷⁴	43.73 ¹⁶³	12.23 ¹⁴	89.42 ²³¹	16.18 ¹⁷	62.08 ²³⁷
Oct. 7.6	24.599 ²²	42.10 ¹⁶³	12.09 ⁶	87.11 ²⁴¹	16.01 ⁹	59.71 ²⁵³
17.5	24.577 ³⁸	40.47 ¹⁵⁵	12.03 ³	84.70 ²⁴²	15.92 ¹	57.18 ²⁵⁴
27.5	24.615 ¹⁰²	38.92 ¹⁴⁰	12.06 ¹²	82.28 ²³¹	15.93 ¹³	54.64 ²⁵⁰
Nov. 6.5	24.717 ¹⁶⁷	37.52 ¹¹⁷	12.18 ²²	79.97 ²¹¹	16.06 ²³	52.14 ²³³
16.5	24.884 ²²⁹	36.35 ⁸⁸	12.40 ³¹	77.86 ¹⁸³	16.29 ³⁴	49.81 ²⁰⁶
26.4	25.113 ²⁸⁸	35.47 ⁵⁵	12.71 ³⁹	76.03 ¹⁴⁶	16.63 ⁵²	47.75 ¹⁷¹
Dec. 6.4	25.401 ³³⁸	34.92 ¹⁸	13.10 ⁴⁶	74.57 ¹⁰²	17.06 ⁵²	46.04 ¹²⁹
16.4	25.739 ³⁷⁷	34.74 ²¹	13.56 ⁵³	73.55 ⁵⁶	17.58 ⁵⁸	44.75 ⁸²
26.3	26.116 ⁴⁰⁵	34.95 ⁵⁸	14.09 ⁵⁵	72.99 ⁷	18.16 ⁶⁴	43.93 ³²
36.3	26.521	35.53	14.64	72.92	18.80	43.61
Mean Place	22.217	23.94	10.066	65.12	13.832	36.98
Sec δ , Tan δ	1.343	— 0.896	2.035	— 1.773	2.339	— 2.115
a, a'	+3.8	—15.8	+4.6	—15.6	+4.9	—15.5
b, b'	+0.05	+ 0.6	+0.09	+ 0.6	+0.11	+ 0.6
Authority and Catalogue No.	B.J.	873	A.E.	875	A.N.	877

No. 875. Corrected for a parallax of 0".76. The reductions from $c.g.$ to brighter star (α^2), vary during the year from +0".214, —1".07 to +0".182, —1".45. The mean place is that of $c.g.$
 † Second transit, Apr. 30 † First transit, May 1

APPARENT PLACES OF STARS, 1935

455

AT UPPER TRANSIT AT GREENWICH

Name	α Lupi		α Apodis		ε Bootis	
	2·89	B2	3·81	K5	2·70	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 14 ^m 37	−47° 06′	^h 14 ^m 39	−78° 46′	^h 14 ^m 42	+27° 20′
Jan. 1·3	35·624	32·33	39·14	06·39	08·908	34·01
11·3	36·073	32·91	40·46	05·94	09·235	31·56
21·3	36·532	33·87	41·83	06·06	09·575	29·46
31·3	36·989	35·17	43·20	06·73	09·919	27·78
Feb. 10·2	37·434	36·76	44·56	07·93	10·257	26·56
20·2	37·858	38·60	45·87	09·62	10·579	25·86
Mar. 2·2	38·252	40·62	47·09	11·74	10·878	25·67
12·1	38·611	42·78	48·21	14·23	11·148	25·98
22·1	38·933	45·02	49·21	17·04	11·387	26·75
Apr. 1·1	39·215	47·30	50·08	20·09	11·591	27·94
11·1	39·455	49·58	50·80	23·31	11·759	29·49
21·0	39·653	51·82	51·37	26·64	11·891	31·30
May 1·0	39·808	53·98	51·77	30·00	11·986	33·30
10·9	39·920	56·02	52·00	33·33	12·047	35·41
20·9	39·989	57·91	52·07	36·55	12·074	37·55
30·9	40·015	59·62	51·97	39·59	12·069	39·63
June 9·9	39·999	61·11	51·70	42·39	12·034	41·60
19·9	39·942	62·36	51·28	44·87	11·969	43·39
29·8	39·846	63·33	50·71	46·98	11·878	44·96
July 9·8	39·715	64·00	50·02	48·66	11·763	46·26
19·8	39·552	64·35	49·23	49·86	11·628	47·27
29·8	39·364	64·36	48·36	50·55	11·477	47·95
Aug. 8·7	39·159	64·03	47·44	50·70	11·313	48·29
18·7	38·944	63·37	46·51	50·30	11·143	48·28
28·7	38·733	62·39	45·60	49·37	10·974	47·91
Sept. 7·7	38·533	61·13	44·75	47·92	10·811	47·19
17·6	38·357	59·62	43·99	46·00	10·664	46·12
27·6	38·217	57·93	43·37	43·69	10·540	44·70
Oct. 7·6	38·125	56·11	42·92	41·04	10·446	42·95
17·5	38·089	54·26	42·66	38·18	10·392	40·89
27·5	38·118	52·44	42·61	35·21	10·383	38·54
Nov. 6·5	38·216	50·75	42·79	32·23	10·423	35·96
16·5	38·385	49·27	43·20	29·38	10·516	33·19
26·4	38·623	48·06	43·82	26·77	10·662	30·28
Dec. 6·4	38·925	47·19	44·65	24·49	10·858	27·32
16·4	39·282	46·69	45·65	22·64	11·100	24·39
26·4	39·682	46·60	46·81	21·28	11·381	21·58
36·3	40·115	46·91	48·07	20·45	11·693	18·97
Mean Place	35·702	36·91	41·668	15·97	08·813	50·63
Sec δ, Tan δ	1·469	−1·077	5·135	−5·037	1·126	+0·517
a, a'	+4·0	−15·5	+7·4	−15·4	+2·6	−15·2
b, b'	+0·06	+0·6	+0·26	+0·6	−0·03	+0·6
Authority and Catalogue No.	A.N.	878	B.J.	881	A.N.	885

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	α Libræ		β Ursæ Minoris		ζ^2 Libræ	
	2.90	A ₃	2.24	K ₅	5.63	K ₀
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 14 47	^m —15 46	^h 14 50	^m +74 24	^h 14 53	^m —11 08
Jan. 1.3	16.826	25.72	50.30	52.05	14.350	59.72
11.3	17.158	27.25	51.04	49.67	14.675	61.36
21.3	17.500	28.85	51.86	47.88	15.009	63.03
31.3	17.842	30.48	52.72	46.72	15.345	64.68
Feb. 10.2	18.176	32.07	53.59	46.25	15.673	66.22
20.2	18.494	33.57	54.44	46.45	15.988	67.64
Mar. 2.2	18.791	34.95	55.25	47.33	16.281	68.89
12.1	19.062	36.18	55.98	48.82	16.552	69.93
22.1	19.306	37.23	56.61	50.86	16.795	70.78
Apr. 1.1	19.521	38.10	57.12	53.35	17.009	71.39
11.1	19.706	38.79	57.50	56.20	17.196	71.82
21.0	19.862	39.31	57.74	59.28	17.353	72.06
May 1.0	19.988	39.67	57.84	62.48	17.484	72.12
10.9	20.085	39.90	57.79	65.68	17.582	72.05
20.9	20.152	40.01	57.62	68.78	17.655	71.87
30.9	20.191	40.00	57.32	71.67	17.696	71.59
June 9.9	20.200	39.90	56.90	74.27	17.708	71.25
19.9	20.182	39.72	56.38	76.50	17.694	70.84
29.8	20.135	39.45	55.77	78.30	17.652	70.40
July 9.8	20.064	39.12	55.08	79.63	17.586	69.92
19.8	19.970	38.73	54.35	80.45	17.495	69.43
29.8	19.856	38.27	53.58	80.75	17.386	68.92
Aug. 8.7	19.727	37.77	52.78	80.52	17.259	68.41
18.7	19.589	37.24	51.98	79.75	17.123	67.91
28.7	19.449	36.68	51.20	78.48	16.984	67.43
Sept. 7.7	19.315	36.12	50.46	76.70	16.849	66.99
17.6	19.194	35.58	49.77	74.47	16.726	66.62
27.6	19.095	35.11	49.16	71.82	16.626	66.34
Oct. 7.6	19.028	34.73	48.63	68.81	16.555	66.20
17.5	19.000	34.48	48.22	65.47	16.519	66.21
27.5	19.016	34.41	47.92	61.90	16.531	66.39
Nov. 6.5	19.082	34.53	47.77	58.16	16.588	66.78
16.5	19.200	34.89	47.76	54.34	16.695	67.41
26.4	19.369	35.48	47.90	50.53	16.855	68.26
Dec. 6.4	19.585	36.32	48.19	46.85	17.060	69.33
16.4	19.844	37.39	48.63	43.40	17.309	70.62
26.4	20.137	38.66	49.20	40.29	17.591	72.05
36.3	20.456	40.09	49.88	37.61	17.902	73.64
Mean Place	16.668	21.69	52.373	76.16	14.211	54.28
Sec δ , Tan δ	1.039	— 0.282	3.724	+ 3.587	1.019	— 0.197
a, a'	+3.3	—14.9	—0.2	—14.7	+3.3	—14.6
b, b'	+0.01	+ 0.7	—0.18	+ 0.7	+0.01	+ 0.7
Authority and Catalogue No.	B.J.	891	B.J.	896	A.E.	899

APPARENT PLACES OF STARS, 1935

457

AT UPPER TRANSIT AT GREENWICH

Name	β Lupi		κ Centauri		β Bootis	
	2.81	B2p	3.35	B3	3.63	G5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 14 ^m 54	[°] -42 ['] 52	^h 14 ^m 54	[°] -41 ['] 50	^h 14 ^m 59	[°] +40 ['] 38
Jan. 1.3	15.762	20.70	55.310	37.44	29.564	26.96
11.3	16.178 ⁴¹⁶	21.24 ⁵⁴	55.720 ⁴¹⁰	38.01 ⁵⁷	29.908 ³⁴⁴	24.31 ²⁶⁵
21.3	16.607 ⁴²⁹	22.12 ⁸⁸	56.143 ⁴²³	38.91 ⁹⁰	30.274 ³⁶⁶	22.09 ²²²
31.3	17.039 ⁴³²	23.30 ¹¹⁸	56.569 ⁴²⁶	40.09 ¹¹⁸	30.650 ³⁷⁶	20.39 ¹⁷⁰
Feb. 10.2	17.461 ⁴²²	24.73 ¹⁴³	56.987 ⁴¹⁸	41.52 ¹⁴³	31.025 ³⁷⁵	19.24 ¹¹⁵
	17.461 ⁴⁰⁶	24.73 ¹⁶³	56.987 ⁴⁰⁰	41.52 ¹⁶²	31.025 ³⁶³	19.24 ⁵⁵
20.2	17.867	26.36	57.387	43.14	31.388	18.69
Mar. 2.2	18.249 ³⁸²	28.15 ¹⁷⁹	57.764 ³⁷⁷	44.91 ¹⁷⁷	31.729 ³⁴¹	18.75 ⁶
12.2	18.601 ³⁵²	30.06 ¹⁹¹	58.112 ³⁴⁸	46.78 ¹⁸⁷	32.042 ³¹³	19.38 ⁶³
22.1	18.921 ³²⁰	32.03 ¹⁹⁷	58.428 ³¹⁶	48.72 ¹⁹⁴	32.321 ²⁷⁹	20.56 ¹¹⁸
Apr. 1.1	19.205 ²⁸⁴	34.02 ¹⁹⁹	58.708 ²⁸⁰	50.67 ¹⁹⁵	32.560 ²³⁹	22.21 ¹⁶⁵
	19.205 ²⁴⁷	34.02 ¹⁹⁹	58.708 ²⁴⁵	50.67 ¹⁹⁴	32.560 ¹⁹⁸	22.21 ²⁰⁴
11.1	19.452	36.01	58.953	52.61	32.758	24.25
21.0	19.661 ²⁰⁹	37.96 ¹⁹⁵	59.160 ²⁰⁷	54.50 ¹⁸⁹	32.913 ¹⁵⁵	26.60 ²³⁵
May 1.0	19.831 ¹⁷⁰	39.84 ¹⁸⁸	59.329 ¹⁶⁹	56.32 ¹⁸²	33.024 ¹¹¹	29.15 ²⁵⁵
10.9	19.962 ¹³¹	41.62 ¹⁷⁸	59.459 ¹³⁰	58.04 ¹⁷²	33.091 ⁶⁷	31.81 ²⁶⁶
20.9	20.053 ⁹¹	43.27 ¹⁶⁵	59.550 ⁹¹	59.64 ¹⁶⁰	33.117 ²⁶	34.48 ²⁶⁷
	20.053 ⁵⁰	43.27 ¹⁵¹	59.550 ⁵¹	59.64 ¹⁴⁵	33.117 ¹⁵	34.48 ²⁶⁰
30.9	20.103	44.78	59.601	61.09	33.102	37.08
June 9.9	20.112 ⁹	46.10 ¹³²	59.612 ¹¹	62.36 ¹²⁷	33.049 ⁵³	39.51 ²⁴³
19.9	20.082 ³⁰	47.22 ¹¹²	59.585 ²⁷	63.43 ¹⁰⁷	33.049 ⁹⁰	39.51 ²²¹
29.9	20.014 ⁶⁸	48.10 ⁸⁸	59.519 ⁶⁶	64.27 ⁸⁴	32.959 ¹²⁴	41.72 ¹⁹²
July 9.8	19.909 ¹⁰⁵	48.73 ⁶³	59.418 ¹⁰¹	64.87 ⁶⁰	32.835 ¹⁵²	43.64 ¹⁵⁸
	19.909 ¹³⁶	48.73 ³⁶	59.418 ¹³²	64.87 ³³	32.683 ¹⁷⁸	45.22 ¹¹⁹
19.8	19.773	49.09	59.286	65.20	32.505	46.41
29.8	19.609 ¹⁶⁴	49.15 ⁶	59.126 ¹⁶⁰	65.24 ⁴	32.305 ²⁰⁰	47.21 ⁸⁰
Aug. 8.7	19.424 ¹⁸⁵	48.92 ²³	58.947 ¹⁷⁹	65.00 ²⁴	32.091 ²¹⁴	47.57 ³⁶
18.7	19.227 ¹⁹⁷	48.39 ⁵³	58.755 ¹⁹²	64.47 ⁵³	31.867 ²²⁴	47.50 ⁷
28.7	19.028 ¹⁹⁹	47.58 ⁸¹	58.560 ¹⁹⁵	63.67 ⁸⁰	31.642 ²²⁵	46.99 ⁵¹
	19.028 ¹⁹²	47.58 ¹⁰⁷	58.560 ¹⁸⁸	63.67 ¹⁰⁵	31.642 ²¹⁸	46.99 ⁹⁵
Sept. 7.7	18.836	46.51	58.372	62.62	31.424	46.04
17.6	18.663 ¹⁷³	45.21 ¹³⁰	58.202 ¹⁷⁰	61.36 ¹²⁶	31.221 ²⁰³	44.67 ¹³⁷
27.6	18.520 ¹⁴³	43.75 ¹⁴⁶	58.062 ¹⁴⁰	59.93 ¹⁴³	31.042 ¹⁷⁹	42.89 ¹⁷⁸
Oct. 7.6	18.419 ¹⁰¹	42.17 ¹⁵⁸	57.962 ¹⁰⁰	58.40 ¹⁵³	30.897 ¹⁴⁵	40.73 ²¹⁶
17.6	18.369 ⁵⁰	40.55 ¹⁶²	57.912 ⁵⁰	56.82 ¹⁵⁸	30.793 ¹⁰⁴	38.22 ²⁵¹
	18.369 ⁸	40.55 ¹⁶⁰	57.912 ⁸	56.82 ¹⁵⁴	30.793 ⁵⁴	38.22 ²⁸²
27.5	18.377	38.95	57.920	55.28	30.739	35.40
Nov. 6.5	18.450 ⁷³	37.47 ¹⁴⁸	57.991 ⁷¹	53.85 ¹⁴³	30.740 ¹	32.33 ³⁰⁷
16.5	18.590 ¹⁴⁰	36.16 ¹³¹	58.128 ¹³⁷	52.60 ¹²⁵	30.800 ⁶⁰	29.07 ³²⁶
26.4	18.795 ²⁰⁵	35.10 ¹⁰⁶	58.330 ²⁰²	51.59 ¹⁰¹	30.920 ¹²⁰	25.70 ³³⁷
Dec. 6.4	19.061 ²⁶⁶	34.35 ⁷⁵	58.592 ²⁶²	50.88 ⁷¹	31.099 ¹⁷⁹	22.32 ³³⁸
	19.061 ³²¹	34.35 ⁴³	58.592 ³¹⁶	50.88 ³⁸	31.099 ²³⁵	22.32 ³³¹
16.4	19.382	33.92	58.908	50.50	31.334	19.01
26.4	19.747 ³⁶⁵	33.86 ⁶	59.268 ³⁶⁰	50.48 ²	31.616 ²⁸²	15.87 ³¹⁴
36.3	20.145 ³⁹⁸	34.16 ³⁰	59.661 ³⁹³	50.82 ³⁴	31.938 ³²²	13.02 ²⁸⁵
Mean Place	15.849	23.81	55.387	40.27	29.762	46.14
Sec δ , Tan δ	1.365	-0.928	1.342	-0.896	1.318	+0.859
a, a'	+3.9	-14.5	+3.9	-14.5	+2.3	-14.2
b, b'	+0.04	+0.7	+0.04	+0.7	-0.04	+0.7
Authority and Catalogue No.	B.J.	901	A.N.	902	B.J.	906

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	σ Libræ		ψ Bootis		ζ Lupi	
	3.41	Mb	4.67	Ko	3.50	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 15 00	^m —25 01	^h 15 01	^m +27 11	^h 15 07	^m —51 51
Jan. 1.3	15.629 ³⁴⁶	41.15 ¹¹³	39.468 ³¹⁶	44.44 ²⁵²	35.784 ⁴⁷⁰	07.06 ⁶
11.3	15.975 ³⁵⁸	42.28 ¹³⁰	39.784 ³³³	41.92 ²²⁰	36.254 ⁴⁹⁰	07.12 ⁴⁵
21.3	16.333 ³⁶¹	43.58 ¹⁴²	40.117 ³⁴⁰	39.72 ¹⁷⁹	36.744 ⁴⁹⁷	07.57 ⁸³
31.3	16.694 ³⁵⁴	45.00 ¹⁴⁹	40.457 ³³⁷	37.93 ¹³²	37.241 ⁴⁹²	08.40 ¹¹⁶
Feb. 10.2	17.048 ³⁴⁰	46.49 ¹⁵¹	40.794 ³²⁶	36.61 ⁸²	37.733 ⁴⁷⁶	09.56 ¹⁴⁶
20.2	17.388 ³²⁰	48.00 ¹⁴⁸	41.120 ³⁰⁷	35.79 ³⁰	38.209 ⁴⁵³	11.02 ¹⁷²
Mar. 2.2	17.708 ²⁹⁶	49.48 ¹⁴³	41.427 ²⁸²	35.49 ²²	38.662 ⁴²²	12.74 ¹⁹¹
12.2	18.004 ²⁷⁰	50.91 ¹³³	41.709 ²⁵³	35.71 ⁷⁰	39.084 ³⁸⁷	14.65 ²⁰⁷
22.1	18.274 ²⁴⁰	52.24 ¹²³	41.962 ²²⁰	36.41 ¹¹⁴	39.471 ³⁴⁷	16.72 ²¹⁸
Apr. 1.1	18.514 ²¹⁰	53.47 ¹¹²	42.182 ¹⁸⁵	37.55 ¹⁵¹	39.818 ³⁰⁵	18.90 ²²⁴
11.1	18.724 ¹⁸⁰	54.59 ⁹⁹	42.367 ¹⁵²	39.06 ¹⁸⁰	40.123 ²⁶⁰	21.14 ²²⁷
21.0	18.904 ¹⁴⁹	55.58 ⁸⁶	42.519 ¹¹⁶	40.86 ²⁰²	40.383 ²¹⁵	23.41 ²²⁶
May 1.0	19.053 ¹¹⁸	56.44 ⁷⁵	42.635 ⁸¹	42.88 ²¹⁵	40.598 ¹⁶⁷	25.67 ²²⁰
10.9	19.171 ⁸⁶	57.19 ⁶³	42.716 ⁴⁷	45.03 ²²⁰	40.765 ¹¹⁸	27.87 ²¹¹
20.9	19.257 ⁵⁵	57.82 ⁵¹	42.763 ¹³	47.23 ²¹⁷	40.883 ⁶⁸	29.98 ¹⁹⁷
30.9	19.312 ²²	58.33 ³⁸	42.776 ¹⁹	49.40 ²⁰⁷	40.951 ¹⁸	31.95 ¹⁸⁰
June 9.9	19.334 ⁹	58.71 ²⁷	42.757 ⁵⁰	51.47 ¹⁹²	40.969 ³²	33.75 ¹⁵⁸
19.9	19.325 ⁴⁰	58.98 ¹²	42.707 ⁷⁹	53.39 ¹⁷⁰	40.937 ⁸⁰	35.33 ¹³²
29.9	19.285 ⁶⁹	59.10 ¹	42.628 ¹⁰⁶	55.09 ¹⁴⁴	40.857 ¹²⁶	36.65 ¹⁰⁵
July 9.8	19.216 ⁹⁷	59.11 ¹²	42.522 ¹³⁰	56.53 ¹¹⁶	40.731 ¹⁶⁷	37.70 ⁷²
19.8	19.119 ¹¹⁹	58.99 ²⁶	42.392 ¹⁵⁰	57.69 ⁸³	40.564 ²⁰²	38.42 ³⁸
29.8	19.000 ¹³⁸	58.73 ⁴⁰	42.242 ¹⁶⁵	58.52 ⁴⁹	40.362 ²²⁰	38.80 ²
Aug. 8.7	18.862 ¹⁴⁹	58.33 ⁵²	42.077 ¹⁷⁵	59.01 ¹⁵	40.133 ²⁴⁵	38.82 ³⁵
18.7	18.713 ¹⁵⁵	57.81 ⁶³	41.902 ¹⁷⁸	59.16 ²¹	39.888 ²⁵²	38.47 ⁷²
28.7	18.558 ¹⁵⁰	57.18 ⁷³	41.724 ¹⁷⁴	58.95 ⁵⁸	39.636 ²⁴⁵	37.75 ¹⁰⁵
Sept. 7.7	18.408 ¹³⁷	56.45 ⁷⁹	41.550 ¹⁶¹	58.37 ⁹⁴	39.391 ²²⁵	36.70 ¹³⁷
17.6	18.271 ¹¹⁴	55.66 ⁸²	41.389 ¹⁴¹	57.43 ¹²⁹	39.166 ¹⁹¹	35.33 ¹⁶³
27.6	18.157 ⁸³	54.84 ⁸⁰	41.248 ¹¹³	56.14 ¹⁶⁴	38.975 ¹⁴⁴	33.70 ¹⁸²
Oct. 7.6	18.074 ⁴²	54.04 ⁷³	41.135 ⁷⁵	54.50 ¹⁹⁶	38.831 ⁸⁶	31.88 ¹⁹⁶
17.6	18.032 ⁵	53.31 ⁶³	41.060 ³¹	52.54 ²²⁵	38.745 ¹⁷	29.92 ²⁰⁰
27.5	18.037 ⁵⁷	52.68 ⁴⁶	41.029 ¹⁸	50.29 ²⁵¹	38.728 ⁵⁷	27.92 ¹⁹⁵
Nov. 6.5	18.094 ¹¹³	52.22 ²⁶	41.047 ⁷¹	47.78 ²⁷³	38.785 ¹³⁵	25.97 ¹⁸³
16.5	18.207 ¹⁶⁷	51.96 ²	41.118 ¹²⁴	45.05 ²⁸⁸	38.920 ²¹³	24.14 ¹⁶²
26.4	18.374 ²¹⁸	51.94 ²³	41.242 ¹⁷⁵	42.17 ²⁹⁵	39.133 ²⁸⁵	22.52 ¹³³
Dec. 6.4	18.592 ²⁶⁴	52.17 ⁵⁰	41.417 ²²⁴	39.22 ²⁹⁶	39.418 ³⁵⁰	21.19 ¹⁰⁰
16.4	18.856 ³⁰²	52.67 ⁷⁵	41.641 ²⁶⁴	36.26 ²⁸⁵	39.768 ⁴⁰⁶	20.19 ⁶¹
26.4	19.158 ³³⁰	53.42 ⁹⁹	41.905 ²⁹⁸	33.41 ²⁶⁷	40.174 ⁴⁴⁷	19.58 ²²
36.3	19.488	54.41	42.203	30.74	40.621	19.36
Mean Place	15.568	39.57	39.502	60.53	36.114	11.63
Sec 8, Tan 8	1.104	— 0.467	1.124	+ 0.514	1.619	— 1.273
a, a'	+3.5	—14.2	+2.6	—14.1	+4.3	—13.7
b, b'	+0.02	+ 0.7	—0.02	+ 0.7	+0.06	+ 0.7
Authority and Catalogue No.	B.J.	907	B.J.	910	B.J.	914

† Second transit, May 10

APPARENT PLACES OF STARS, 1935

459

AT UPPER TRANSIT AT GREENWICH

Name	♌ Libræ		♐ Trianguli Australis		♏ Bootis	
	4.66	Aop	3.06	Ao	3.54	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 15 ^m 08	—19° 32′	^h 15 ^m 12	—68° 26′	^h 15 ^m 12	+33° 32′
Jan. 1.4	30.679	52.11	47.54	21.42	52.609	65.66
11.3	31.009	53.37	48.26	20.81	52.927	63.00
21.3	31.352	54.75	49.02	20.69	53.267	60.72
31.3	31.700	56.20	49.80	21.06	53.618	58.87
Feb. 10.2	32.043	57.65	50.58	21.91	53.969	57.54
20.2	32.373	59.06	51.34	23.18	54.311	56.76
Mar. 2.2	32.686	60.40	52.06	24.84	54.636	56.55
12.2	32.977	61.63	52.75	26.85	54.936	56.89
22.1	33.242	62.72	53.37	29.15	55.208	57.76
Apr. 1.1	33.480	63.67	53.93	31.68	55.446	59.09
11.1	33.689	64.47	54.42	34.38	55.649	60.83
21.1	33.870	65.12	54.84	37.21	55.815	62.90
May 1.0	34.022	65.64	55.18	40.10	55.942	65.19
11.0	34.143	66.04	55.43	42.99	56.031	67.62
20.9	34.234	66.32	55.59	45.83	56.083	70.10
30.9	34.295	66.50	55.67	48.55	56.098	72.54
June 9.9	34.325	66.58	55.65	51.10	56.076	74.87
19.9	34.323	66.57	55.55	53.40	56.020	77.03
29.9	34.291	66.48	55.36	55.42	55.931	78.94
July 9.8	34.230	66.31	55.10	57.07	55.813	80.56
19.8	34.143	66.05	54.76	58.34	55.669	81.86
29.8	34.032	65.71	54.37	59.18	55.501	82.79
Aug. 8.8	33.902	65.29	53.94	59.54	55.317	83.34
18.7	33.759	64.80	53.48	59.43	55.121	83.51
28.7	33.610	64.26	53.01	58.82	54.920	83.26
Sept. 7.7	33.464	63.68	52.55	57.75	54.722	82.61
17.6	33.328	63.08	52.14	56.23	54.536	81.56
27.6	33.213	62.49	51.78	54.33	54.370	80.12
Oct. 7.6	33.127	61.96	51.49	52.09	54.233	78.31
17.6	33.078	61.51	51.30	49.62	54.134	76.15
27.5	33.074	61.20	51.23	47.00	54.079	73.67
Nov. 6.5	33.121	61.06	51.27	44.34	54.075	70.92
16.5	33.220	61.12	51.44	41.75	54.126	67.96
26.5	33.371	61.40	51.73	39.32	54.234	64.85
Dec. 6.4	33.573	61.92	52.14	37.16	54.397	61.67
16.4	33.821	62.67	52.66	35.35	54.611	58.51
26.4	34.106	63.64	53.27	33.96	54.871	55.47
36.3	34.421	64.79	53.95	33.02	55.168	52.64
Mean Place	30.629	48.90	48.716	28.43	52.793	82.85
Sec δ, Tan δ	1.061	— 0.355	2.721	— 2.531	1.200	+ 0.663
a, a'	+3.4	—13.6	+5.6	—13.4	+2.4	—13.4
b, b'	+0.02	+ 0.7	+0.11	+ 0.7	—0.03	+ 0.7
Authority and Catalogue No.	A.N.	915	B.J.	918	B.J.	919

† Second transit, May 10

† First transit, May 11

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	β Libræ		δ Lupi		α^3 Libræ	
	2.74	B8	3.43	B2	6.74	K2
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 15 13	[°] ['] 9 08	^h ^m 15 17	[°] ['] 40 24	^h ^m 15 19	[°] ['] 14 54
Jan. 1.4	30.357 ³¹²	45.29 ¹⁶¹	05.695 ³⁹²	46.63 ³⁹	24.010 ³¹⁷	16.14 ¹³⁷
11.3	30.669 ³²⁶	46.90 ¹⁶²	06.087 ⁴⁰⁹	47.02 ⁶⁹	24.327 ³³²	17.51 ¹⁴⁴
21.3	30.995 ³³¹	48.52 ¹⁵⁸	06.496 ⁴¹⁶	47.71 ⁹⁶	24.659 ³³⁸	18.95 ¹⁴⁵
Feb. 31.3	31.326 ³²⁷	50.10 ¹⁴⁷	06.912 ⁴¹⁴	48.67 ¹¹⁹	24.997 ³³⁵	20.40 ¹⁴²
10.2	31.653 ³¹⁶	51.57 ¹³²	07.326 ⁴⁰¹	49.86 ¹³⁸	25.332 ³²⁵	21.82 ¹³³
20.2	31.969 ³⁰⁰	52.89 ¹¹³	07.727 ³⁸³	51.24 ¹⁵²	25.657 ³¹⁰	23.15 ¹²⁰
Mar. 2.2	32.269 ²⁷⁹	54.02 ⁹¹	08.110 ³⁵⁸	52.76 ¹⁶²	25.967 ²⁸⁹	24.35 ¹⁰⁴
12.2	32.548 ²⁵⁵	54.93 ⁶⁹	08.468 ³³⁰	54.38 ¹⁶⁸	26.256 ²⁶⁶	25.39 ⁸⁷
22.1	32.803 ²²⁹	55.62 ⁴⁶	08.798 ²⁹⁹	56.06 ¹⁷²	26.522 ²⁴⁰	26.26 ⁶⁹
Apr. 1.1	33.032 ²⁰²	56.08 ²⁵	09.097 ²⁶⁶	57.78 ¹⁷²	26.762 ²¹⁴	26.95 ⁵²
11.1	33.234 ¹⁷⁵	56.33 ⁶	09.363 ²³¹	59.50 ¹⁶⁹	26.976 ¹⁸⁶	27.47 ³⁶
21.1	33.409 ¹⁴⁶	56.39 ¹¹	09.594 ¹⁹⁵	61.19 ¹⁶⁴	27.162 ¹⁵⁷	27.83 ²⁰
May 1.0	33.555 ¹¹⁸	56.28 ²⁴	09.789 ¹⁵⁷	62.83 ¹⁵⁷	27.319 ¹²⁹	28.03 ⁹
11.0	33.673 ⁸⁹	56.04 ³⁵	09.946 ¹¹⁸	64.40 ¹⁴⁸	27.448 ⁹⁹	28.12 ³
20.9	33.762 ⁶⁰	55.69 ⁴³	10.064 ⁷⁹	65.88 ¹³⁷	27.547 ⁶⁸	28.09 ¹¹
30.9	33.822 ²⁹	55.26 ⁴⁸	10.143 ³⁹	67.25 ¹²²	27.615 ³⁸	27.98 ¹⁹
June 9.9	33.851 [—]	54.78 ⁵²	10.182 ²	68.47 ¹⁰⁵	27.653 ⁶	27.79 ²⁵
19.9	33.851 ²⁹	54.26 ⁵⁵	10.180 ⁴²	69.52 ⁸⁷	27.659 ²³	27.54 ²⁹
29.9	33.822 ⁵⁷	53.71 ⁵⁴	10.138 ⁸⁰	70.39 ⁶⁶	27.636 ⁵⁴	27.25 ³⁵
July 9.8	33.765 ⁸²	53.17 ⁵⁴	10.058 ¹¹⁵	71.05 ⁴²	27.582 ⁸⁰	26.90 ³⁷
19.8	33.683 ¹⁰⁶	52.63 ⁵³	09.943 ¹⁴⁵	71.47 ¹⁷	27.502 ¹⁰⁵	26.53 ⁴¹
29.8	33.577 ¹²⁴	52.10 ⁵⁰	09.798 ¹⁷⁰	71.64 ⁹	27.397 ¹²⁴	26.12 ⁴⁴
Aug. 8.8	33.453 ¹³⁷	51.60 ⁴⁷	09.628 ¹⁸⁷	71.55 ³⁶	27.273 ¹⁴⁰	25.68 ⁴⁶
18.7	33.316 ¹⁴³	51.13 ⁴²	09.441 ¹⁹⁵	71.19 ⁶²	27.133 ¹⁴⁷	25.22 ⁴⁷
28.7	33.173 ¹⁴³	50.71 ³⁷	09.246 ¹⁹³	70.57 ⁸⁶	26.986 ¹⁴⁷	24.75 ⁴⁷
Sept. 7.7	33.030 ¹³³	50.34 ²⁸	09.053 ¹⁷⁹	69.71 ¹⁰⁸	26.839 ¹³⁸	24.28 ⁴⁴
17.6	32.897 ¹¹⁵	50.06 ¹⁸	08.874 ¹⁵⁵	68.63 ¹²⁵	26.701 ¹²⁰	23.84 ³⁹
27.6	32.782 ⁸⁹	49.88 ¹⁰	08.719 ¹²⁰	67.38 ¹³⁸	26.581 ⁹²	23.45 ³²
Oct. 7.6	32.693 ⁵³	49.83 ¹⁰	08.599 ⁷³	66.00 ¹⁴⁴	26.489 ⁵⁸	23.13 ¹⁹
17.6	32.640 ¹¹	49.93 ²⁸	08.526 ¹⁸	64.56 ¹⁴⁴	26.431 ¹⁵	22.94 ⁶
27.5	32.629 ³⁶	50.21 ⁴⁸	08.508 ⁴³	63.12 ¹³⁷	26.416 ³³	22.88 ¹²
Nov. 6.5	32.665 ⁸⁷	50.69 ⁷⁰	08.551 ¹⁰⁸	61.75 ¹²²	26.449 ⁸⁵	23.00 ³²
16.5	32.752 ¹³⁷	51.39 ⁹¹	08.659 ¹⁷²	60.53 ¹⁰²	26.534 ¹³⁶	23.32 ⁵³
26.5	32.889 ¹⁸⁵	52.30 ¹¹¹	08.831 ²³³	59.51 ⁷⁷	26.670 ¹⁸⁶	23.85 ⁷⁵
Dec. 6.4	33.074 ²²⁹	53.41 ¹³⁰	09.064 ²⁸⁸	58.74 ⁴⁷	26.856 ²³²	24.60 ⁹⁶
16.4	33.303 ²⁶⁷	54.71 ¹⁴⁶	09.352 ³³⁵	58.27 ¹⁵	27.088 ²⁶⁹	25.56 ¹¹⁴
26.4	33.570 ²⁹⁶	56.17 ¹⁵⁵	09.687 ³⁷³	58.12 ¹⁷	27.357 ³⁰⁰	26.70 ¹²⁸
36.3	33.866	57.72	10.060	58.29	27.657	27.98
Mean Place	30.304	39.18	05.849	48.47	23.991	11.57
Sec δ , Tan δ	1.013	- 0.161	1.313	- 0.851	1.035	- 0.266
a, a'	+3.2	-13.3	+3.9	-13.1	+3.3	-12.9
b, b'	+0.01	+ 0.7	+0.04	+ 0.8	+0.01	+ 0.8
Authority and Catalogue No.	B.J.	920	A.N.	923	N.A.	926

† First transit, May 11

APPARENT PLACES OF STARS, 1935

461

AT UPPER TRANSIT AT GREENWICH

Name	γ Ursæ Minoris		ι Draconis		32 Libræ	
Mag. Spect.	3·14	A2	3·47	Ko	5·92	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 15 20	[°] ['] +72 03	^h ^m 15 23	[°] ['] +59 11	^h ^m 15 24	[°] ['] -16 29
Jan. 1·4	46·48 ^h 60	32·73 [°] 271	27·667 ^h 412	14·52 [°] 284	35·143 ^h 317	32·01 [°] 128
11·3	47·08 ^h 69	30·02 [°] 217	28·079 ^h 455	11·68 [°] 234	35·460 ^h 333	33·29 [°] 137
21·3	47·77 ^h 73	27·85 [°] 156	28·534 ^h 485	09·34 [°] 176	35·793 ^h 340	34·66 [°] 138
31·3	48·50 ^h 76	26·29 [°] 91	29·019 ^h 498	07·58 [°] 113	36·133 ^h 337	36·04 [°] 140
Feb. 10·3	49·26 ^h 77	25·38 [°] 22	29·517 ^h 495	06·45 [°] 46	36·470 ^h 328	37·44 [°] 129
20·2	50·03 ^h 73	25·16 [°] 46	30·012 ^h 477	05·99 [°] 21	36·798 ^h 314	38·73 [°] 120
Mar. 2·2	50·76 ^h 69	25·62 [°] 112	30·489 ^h 444	06·20 [°] 87	37·112 ^h 293	39·93 [°] 104
12·2	51·45 ^h 61	26·74 [°] 171	30·933 ^h 401	07·07 [°] 147	37·405 ^h 273	40·97 [°] 92
22·1	52·06 ^h 53	28·45 [°] 222	31·334 ^h 348	08·54 [°] 201	37·677 ^h 246	41·89 [°] 74
Apr. 1·1	52·59 ^h 41	30·67 [°] 265	31·682 ^h 286	10·55 [°] 245	37·923 ^h 220	42·63 [°] 57
11·1	53·00 ^h 31	33·32 [°] 297	31·968 ^h 222	13·00 [°] 279	38·143 ^h 193	43·20 [°] 40
21·1	53·31 ^h 19	36·29 [°] 316	32·190 ^h 155	15·79 [°] 302	38·336 ^h 166	43·60 [°] 29
May 1·0	53·50 ^h 6	39·45 [°] 325	32·345 ^h 85	18·81 [°] 314	38·502 ^h 134	43·89 [°] 16
11·0	53·56 ^h 6	42·70 [°] 322	32·430 ^h 17	21·95 [°] 316	38·636 ^h 106	44·05 [°] 5
20·9	53·50 ^h 17	45·92 [°] 309	32·447 ^h 50	25·11 [°] 306	38·742 ^h 73	44·10 [°] 2
30·9	53·33 ^h 28	49·01 [°] 287	32·397 ^h 112	28·17 [°] 288	38·815 ^h 44	44·08 [°] 10
June 9·9	53·05 ^h 38	51·88 [°] 256	32·285 ^h 172	31·05 [°] 262	38·859 ^h 12	43·98 [°] 19
19·9	52·67 ^h 47	54·44 [°] 218	32·113 ^h 226	33·67 [°] 227	38·871 ^h 19	43·79 [°] 20
29·9	52·20 ^h 54	56·62 [°] 176	31·887 ^h 274	35·94 [°] 188	38·852 ^h 50	43·59 [°] 28
July 9·8	51·66 ^h 61	58·38 [°] 128	31·613 ^h 315	37·82 [°] 144	38·802 ^h 80	43·31 [°] 32
19·8	51·05 ^h 65	59·66 [°] 77	31·298 ^h 347	39·26 [°] 96	38·722 ^h 103	42·99 [°] 36
29·8	50·40 ^h 69	60·43 [°] 26	30·951 ^h 373	40·22 [°] 47	38·619 ^h 126	42·63 [°] 41
Aug. 8·8	49·71 ^h 71	60·69 [°] 28	30·578 ^h 387	40·69 [°] 5	38·493 ^h 142	42·22 [°] 45
18·7	49·00 ^h 70	60·41 [°] 79	30·191 ^h 392	40·64 [°] 56	38·351 ^h 149	41·77 [°] 46
28·7	48·30 ^h 69	59·62 [°] 131	29·799 ^h 385	40·08 [°] 106	38·202 ^h 150	41·31 [°] 48
Sept. 7·7	47·61 ^h 65	58·31 [°] 180	29·414 ^h 367	39·02 [°] 155	38·052 ^h 140	40·83 [°] 48
17·7	46·96 ^h 60	56·51 [°] 226	29·047 ^h 336	37·47 [°] 202	37·912 ^h 125	40·35 [°] 44
27·6	46·36 ^h 53	54·25 [°] 267	28·711 ^h 295	35·45 [°] 245	37·787 ^h 97	39·91 [°] 38
Oct. 7·6	45·83 ^h 45	51·58 [°] 304	28·416 ^h 239	33·00 [°] 283	37·690 ^h 62	39·53 [°] 29
17·6	45·38 ^h 34	48·54 [°] 334	28·177 ^h 175	30·17 [°] 317	37·628 ^h 18	39·24 [°] 14
27·5	45·04 ^h 22	45·20 [°] 359	28·002 ^h 100	27·00 [°] 344	37·610 ^h 28	39·10 [°] 3
Nov. 6·5	44·82 ^h 10	41·61 [°] 373	27·902 ^h 20	23·56 [°] 362	37·638 ^h 82	39·13 [°] 20
16·5	44·72 ^h 4	37·88 [°] 380	27·882 ^h 65	19·94 [°] 373	37·720 ^h 132	39·33 [°] 42
26·5	44·76 ^h 17	34·08 [°] 375	27·947 ^h 149	16·21 [°] 373	37·852 ^h 184	39·75 [°] 63
Dec. 6·4	44·93 ^h 31	30·33 [°] 360	28·096 ^h 232	12·48 [°] 363	38·036 ^h 229	40·38 [°] 85
16·4	45·24 ^h 43	26·73 [°] 334	28·328 ^h 308	08·85 [°] 340	38·265 ^h 269	41·23 [°] 105
26·4	45·67 ^h 54	23·39 [°] 297	28·636 ^h 374	05·45 [°] 307	38·534 ^h 298	42·28 [°] 118
36·4	46·21 ^h	20·42 [°]	29·010 ^h	02·38 [°]	38·832 ^h	43·46 [°]
Mean Place	48·817	55·00	28·727	35·50	35·148	27·81
Sec 2, Tan 2	3·247	+ 3·090	1·953	+ 1·677	1·043	- 0·296
a, a'	-0·1	-12·8	+1·3	-12·6	+3·4	-12·6
b, b'	-0·13	+ 0·8	-0·07	+ 0·8	+0·01	+ 0·8
Authority and Catalogue No.	B.J.	928	B.J.	931	A.E.	933

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	γ Lupi m.		α Coronæ Borealis		α Serpentis	
Mag. Spect.	2.95	B ₃	2.31	A ₀	2.75	K ₀
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 15 ^m 30	[°] -40 ['] 56	^h 15 ^m 31	[°] +26 ['] 55	^h 15 ^m 41	[°] +6 ['] 37
Jan. 1.4	47.826 ³⁸⁶	56.82 ²³	55.807 ²⁹⁶	41.63 ²⁶²	03.717 ²⁸⁵	34.16 ²⁰⁷
11.3	48.212 ⁴⁰⁷	57.05 ⁵²	56.103 ³¹⁸	39.01 ²³²	04.002 ³⁰⁵	32.09 ¹⁹⁴
21.3	48.619 ⁴¹⁷	57.57 ⁸⁰	56.421 ³³²	36.69 ¹⁹⁴	04.307 ³¹⁵	30.15 ¹⁷⁵
31.3	49.036 ⁴¹⁷	58.37 ¹⁰³	56.753 ³³⁴	34.75 ¹⁴⁹	04.622 ³¹⁷	28.40 ¹⁴⁸
Feb. 10.3	49.453 ⁴⁰⁷	59.40 ¹²²	57.087 ³³⁰	33.26 ⁹⁸	04.939 ³¹²	26.92 ¹¹⁷
20.2	49.860 ³⁹²	60.62 ¹³⁷	57.417 ³¹⁶	32.28 ⁴⁷	05.251 ³⁰¹	25.75 ⁸²
Mar. 2.2	50.252 ³⁷⁰	61.99 ¹⁴⁹	57.733 ²⁹⁷	31.81 ⁶	05.552 ²⁸⁴	24.93 ⁴⁶
12.2	50.622 ³⁴⁴	63.48 ¹⁵⁷	58.030 ²⁷³	31.87 ⁵⁷	05.836 ²⁶⁴	24.47 ⁹
22.2	50.966 ³¹⁴	65.05 ¹⁶¹	58.303 ²⁴⁴	32.44 ¹⁰³	06.100 ²⁴¹	24.38 ²⁵
Apr. 1.1	51.280 ²⁸³	66.66 ¹⁶²	58.547 ²¹⁴	33.47 ¹⁴³	06.341 ²¹⁷	24.63 ⁵⁷
11.1	51.563 ²⁴⁹	68.28 ¹⁶²	58.761 ¹⁸²	34.90 ¹⁷⁷	06.558 ¹⁸⁹	25.20 ⁸⁴
21.1	51.812 ²¹⁴	69.90 ¹⁶⁰	58.943 ¹⁴⁸	36.67 ²⁰²	06.747 ¹⁶²	26.04 ¹⁰⁵
May 1.0	52.026 ¹⁷⁶	71.50 ¹⁵⁵	59.091 ¹¹⁴	38.69 ²¹⁹	06.909 ¹³³	27.09 ¹²²
11.0	52.202 ¹³⁷	73.05 ¹⁴⁷	59.205 ⁷⁸	40.88 ²²⁸	07.042 ¹⁰⁴	28.31 ¹³²
20.9	52.339 ⁹⁶	74.52 ¹³⁸	59.283 ⁴⁴	43.16 ²²⁸	07.146 ⁷³	29.63 ¹³⁸
30.9	52.435 ⁵⁵	75.90 ¹²⁵	59.327 ⁹	45.44 ²²²	07.219 ⁴³	31.01 ¹³⁸
June 9.9	52.490 ¹³	77.15 ¹¹¹	59.336 ²⁵	47.66 ²⁰⁹	07.262 ¹¹	32.39 ¹³⁴
19.9	52.503 ²⁹	78.26 ⁹⁴	59.311 ⁵⁸	49.75 ¹⁹⁰	07.273 ²¹	33.73 ¹²⁸
29.9	52.474 ⁷⁰	79.20 ⁷⁴	59.253 ⁸⁹	51.65 ¹⁶⁶	07.252 ⁵⁰	35.01 ¹¹⁵
July 9.9	52.404 ¹⁰⁷	79.94 ⁵³	59.164 ¹¹⁷	53.31 ¹³⁸	07.202 ⁷⁸	36.16 ¹⁰¹
19.8	52.297 ¹⁴¹	80.47 ²⁷	59.047 ¹⁴²	54.69 ¹⁰⁷	07.124 ¹⁰⁴	37.17 ⁸⁷
29.8	52.156 ¹⁶⁹	80.74 ²	58.905 ¹⁶²	55.76 ⁷⁵	07.020 ¹²⁶	38.04 ⁶⁹
Aug. 8.8	51.987 ¹⁸⁸	80.76 ²⁴	58.743 ¹⁷⁸	56.51 ³⁸	06.894 ¹⁴²	38.73 ⁵⁰
18.7	51.799 ²⁰⁰	80.52 ⁵²	58.565 ¹⁸⁵	56.89 ³	06.752 ¹⁵³	39.23 ³⁰
28.7	51.599 ²⁰⁰	80.00 ⁷⁶	58.380 ¹⁸⁶	56.92 ³⁴	06.599 ¹⁵⁶	39.53 ⁹
Sept. 7.7	51.399 ¹⁹⁰	79.24 ⁹⁹	58.194 ¹⁷⁹	56.58 ⁷²	06.443 ¹⁵⁰	39.62 ¹³
17.7	51.209 ¹⁶⁷	78.25 ¹¹⁸	58.015 ¹⁶²	55.86 ¹⁰⁸	06.293 ¹³⁷	39.49 ³⁶
27.6	51.042 ¹³³	77.07 ¹³⁴	57.853 ¹³⁸	54.78 ¹⁴³	06.156 ¹¹⁴	39.13 ⁵⁹
Oct. 7.6	50.909 ⁸⁸	75.73 ¹⁴²	57.715 ¹⁰³	53.35 ¹⁷⁸	06.042 ⁸³	38.54 ⁸⁴
17.6	50.821 ³⁵	74.31 ¹⁴⁴	57.612 ⁶²	51.57 ²¹⁰	05.959 ⁴⁵	37.70 ¹⁰⁸
27.6	50.786 ²⁷	72.87 ¹⁴⁰	57.550 ¹⁵	49.47 ²³⁸	05.914 [—]	36.62 ¹³³
Nov. 6.5	50.813 ⁸⁹	71.47 ¹²⁸	57.535 ³⁷	47.09 ²⁶²	05.914 ⁴⁸	35.29 ¹⁵⁵
16.5	50.902 ¹⁵⁷	70.19 ¹¹⁰	57.572 ⁹¹	44.47 ²⁸¹	05.962 ⁹⁸	33.74 ¹⁷⁶
26.5	51.059 ²¹⁹	69.09 ⁸⁷	57.663 ¹⁴³	41.66 ²⁹¹	06.060 ¹⁴⁶	31.98 ¹⁹³
Dec. 6.4	51.278 ²⁷⁶	68.22 ⁵⁹	57.806 ¹⁹⁴	38.75 ²⁹⁶	06.206 ¹⁹³	30.05 ²⁰⁴
16.4	51.554 ³²⁴	67.63 ³⁰	58.000 ²³⁷	35.79 ²⁸⁹	06.399 ²³³	28.01 ²¹¹
26.4	51.878 ³⁶⁴	67.33 ²	58.237 ²⁷⁵	32.90 ²⁷⁴	06.632 ²⁶⁵	25.90 ²¹⁰
36.4	52.242	67.35	58.512	30.16	06.897	23.80
Mean Place	48.041	58.36	56.025	56.66	03.814	44.21
Sec δ , Tan δ	1.324	-0.868	1.122	+0.508	1.007	+0.116
a, a'	+4.0	-12.1	+2.5	-12.1	+2.9	-11.4
b, b'	+0.04	+0.8	-0.02	+0.8	0.00	+0.8
Authority and Catalogue No.	B.J.	941	B.J.	943	B.J.	951

APPARENT PLACES OF STARS, 1935

463

AT UPPER TRANSIT AT GREENWICH

Name	μ Serpentis		ζ Ursæ Minoris		ϵ Serpentis	
	3.63	Ao	4.34	A2	3.75	A2
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 15 ^m 46	[°] — ['] 3 13	^h 15 ^m 46	[°] +77 59	^h 15 ^m 47	[°] + 4 40
Jan. 1.4	13.404 ²⁸⁷	64.93 ¹⁷⁰	15.44 ⁷⁵	22.27 ²⁸⁴	34.274 ²⁸¹	10.36 ¹⁹⁹
11.4	13.691 ³⁰⁷	66.63 ¹⁶⁷	16.19 ⁸⁸	19.43 ²³⁴	34.555 ³⁰²	08.37 ¹⁸⁹
21.3	13.998 ³¹⁷	68.30 ¹⁵⁶	17.07 ⁹⁹	17.09 ¹⁷⁸	34.857 ³¹³	06.48 ¹⁷¹
31.3	14.315 ³²⁰	69.86 ¹⁴⁰	18.06 ¹⁰⁵	15.31 ¹¹⁴	35.170 ³¹⁷	04.77 ¹⁴⁶
Feb. 10.3	14.635 ³¹⁵	71.26 ¹¹⁹	19.11 ¹⁰⁹	14.17 ⁴⁷	35.487 ³¹²	03.31 ¹¹⁸
20.2	14.950 ³⁰⁴	72.45 ⁹⁴	20.20 ¹⁰⁷	13.70 ²²	35.799 ³⁰²	02.13 ⁸⁴
Mar. 2.2	15.254 ²⁸⁹	73.39 ⁶⁷	21.27 ¹⁰²	13.92 ⁸⁷	36.101 ²⁸⁷	01.29 ⁵⁰
12.2	15.543 ²⁶⁹	74.06 ⁴⁰	22.29 ⁹⁴	14.79 ¹⁴⁹	36.388 ²⁶⁷	00.79 ¹⁵
22.2	15.812 ²⁴⁸	74.46 ¹²	23.23 ⁸²	16.28 ²⁰⁴	36.655 ²⁴⁶	00.64 ¹⁸
Apr. 1.1	16.060 ²²⁴	74.58 ¹⁴	24.05 ⁶⁸	18.32 ²⁵⁰	36.901 ²²¹	00.82 ⁴⁹
11.1	16.284 ¹⁹⁹	74.44 ³⁵	24.73 ⁵²	20.82 ²⁸⁵	37.122 ¹⁹⁶	01.31 ⁷⁵
21.1	16.483 ¹⁷²	74.09 ⁵⁴	25.25 ³⁴	23.67 ³¹⁰	37.318 ¹⁶⁹	02.06 ⁹⁶
May 1.1	16.655 ¹⁴⁴	73.55 ⁶⁸	25.59 ¹⁵	26.77 ³²⁴	37.487 ¹⁴⁰	03.02 ¹¹³
11.0	16.799 ¹¹⁶	72.87 ⁷⁸	25.74 ²	30.01 ³²⁶	37.627 ¹¹¹	04.15 ¹²⁴
20.9	16.915 ⁸⁵	72.09 ⁸⁶	25.72 ²¹	33.27 ³¹⁸	37.738 ⁸¹	05.39 ¹²⁹
30.9	17.000 ⁵⁵	71.23 ⁸⁸	25.51 ³⁷	36.45 ²⁹⁹	37.819 ⁵⁰	06.68 ¹³¹
June 9.9	17.055 ²³	70.35 ⁸⁸	25.14 ⁵³	39.44 ²⁷⁴	37.869 ¹⁸	07.99 ¹²⁷
19.9	17.078 ⁸	69.47 ⁸⁵	24.61 ⁶⁹	42.18 ²³⁹	37.887 ¹⁴	09.26 ¹²²
29.9	17.070 ⁴⁰	68.62 ⁸¹	23.92 ⁸⁰	44.57 ²⁰⁰	37.873 ⁴⁴	10.48 ¹¹¹
July 9.9	17.030 ⁶⁹	67.81 ⁷⁴	23.12 ⁹¹	46.57 ¹⁵⁴	37.829 ⁷³	11.59 ⁹⁸
19.8	16.961 ⁹⁶	67.07 ⁶⁷	22.21 ¹⁰⁰	48.11 ¹⁰⁷	37.756 ¹⁰⁰	12.57 ⁸⁵
29.8	16.865 ¹¹⁹	66.40 ⁵⁸	21.21 ¹⁰⁵	49.18 ⁵⁵	37.656 ¹²³	13.42 ⁶⁹
Aug. 8.8	16.746 ¹³⁶	65.82 ⁴⁸	20.16 ¹¹⁰	49.73 ⁴	37.533 ¹⁴⁰	14.11 ⁵¹
18.8	16.610 ¹⁴⁹	65.34 ³⁷	19.06 ¹¹¹	49.77 ⁴⁹	37.393 ¹⁵²	14.62 ³⁴
28.7	16.461 ¹⁵²	64.97 ²⁵	17.95 ¹¹⁰	49.28 ¹⁰⁰	37.241 ¹⁵⁶	14.96 ¹⁴
Sept. 7.7	16.309 ¹⁴⁸	64.72 ¹³	16.85 ¹⁰⁷	48.28 ¹⁵⁰	37.085 ¹⁵¹	15.10 ⁶
17.7	16.161 ¹³⁵	64.59 ³	15.78 ¹⁰⁰	46.78 ¹⁹⁶	36.934 ¹³⁹	15.04 ²⁷
27.6	16.026 ¹¹³	64.62 ¹⁷	14.78 ⁹⁰	44.82 ²⁴¹	36.795 ¹¹⁸	14.77 ⁵⁰
Oct. 7.6	15.913 ⁸¹	64.79 ³⁷	13.88 ⁸⁰	42.41 ²⁸⁰	36.677 ⁸⁶	14.27 ⁷³
17.6	15.832 ⁴³	65.16 ⁵⁶	13.08 ⁶⁶	39.61 ³¹³	36.591 ⁴⁹	13.54 ⁹⁶
27.6	15.789 ¹	65.72 ⁷⁶	12.42 ⁴⁹	36.48 ³⁴¹	36.542 ⁵	12.58 ¹²⁰
Nov. 6.5	15.790 ⁵⁰	66.48 ⁹⁷	11.93 ³²	33.07 ³⁶⁰	36.537 ⁴³	11.38 ¹⁴²
16.5	15.840 ¹⁰⁰	67.45 ¹¹⁷	11.61 ¹²	29.47 ³⁷¹	36.580 ⁹³	09.96 ¹⁶³
26.5	15.940 ¹⁵⁰	68.62 ¹³⁵	11.49 ⁷	25.76 ³⁷¹	36.673 ¹⁴²	08.33 ¹⁸⁰
Dec. 6.5	16.090 ¹⁹⁵	69.97 ¹⁵¹	11.56 ²⁷	22.05 ³⁶¹	36.815 ¹⁸⁸	06.53 ¹⁹³
16.4	16.285 ²³⁵	71.48 ¹⁶²	11.83 ⁴⁷	18.44 ³⁴⁰	37.003 ²²⁹	04.60 ²⁰¹
26.4	16.520 ²⁶⁸	73.10 ¹⁶⁸	12.30 ⁶⁴	15.04 ³⁰⁷	37.232 ²⁶¹	02.59 ²⁰²
36.4	16.788	74.78	12.94	11.97	37.493	00.59 ²⁰⁰
Mean Place	13.489	57.34	20.126	43.04	34.389	19.83
Sec δ , Tan δ	1.002	— 0.056	4.808	+ 4.703	1.003	+ 0.082
a, a'	+3.1	—11.0	—2.2	—11.0	+3.0	—10.9
b, b'	0.00	+ 0.8	—0.17	+ 0.8	0.00	+ 0.8
Authority and Catalogue No.	B.J.	955	B.J.	957	B.J.	958

† Second transit, May 20

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	β Trianguli Australis		γ Serpentis		π Scorpii	
	3·04		3·86		3·00	
	Fo		F ₅		B ₂	
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 15 49	[°] ['] -63 13	^h ^m 15 53	[°] ['] +15 51	^h ^m 15 54	[°] ['] -25 55
Jan. 1·4	22·76	50·59	26·670	69·32	54·686	44·31
11·4	23·33	49·69	26·945 ²⁷⁵	66·92 ²⁴⁰	55·003 ³¹⁷	44·99 ⁶⁸
21·3	23·94	49·23	27·243 ²⁹⁸	64·72 ²²⁰	55·343 ³⁴⁰	45·82 ⁸³
31·3	24·58	49·19 ⁴	27·556 ³¹³	62·79 ¹⁹³	55·695 ³⁵²	46·77 ⁹⁵
Feb. 10·3	25·23	49·57 ³⁸	27·874 ³¹⁸	61·21 ¹⁵⁸	56·051 ³⁵⁶	47·80 ¹⁰³
20·2	25·88	50·35 ⁷⁸	28·190 ³¹⁶	60·03 ¹¹⁸	56·403 ³⁵²	48·87 ¹⁰⁷
Mar. 2·2	26·51	51·49 ¹¹⁴	28·497 ³⁰⁷	59·27 ⁷⁶	56·745 ³⁴²	49·93 ¹⁰⁶
12·2	27·12	52·96 ¹⁴⁷	28·789 ²⁹²	58·97 ³⁰	57·072 ³²⁷	50·97 ¹⁰⁴
22·2	27·69	54·72 ¹⁷⁶	29·062 ²⁷³	59·10 ¹³	57·380 ³⁰⁸	51·96 ⁹⁹
Apr. 1·1	28·21	56·72 ²⁰⁰	29·313 ²⁵¹	59·64 ⁵⁴	57·665 ²⁸⁵	52·87 ⁹¹
11·1	28·69	58·92 ²²⁰	29·539 ²²⁶	60·56 ⁹²	57·927 ²⁶²	53·70 ⁸³
21·1	29·12	61·27 ²³⁵	29·738 ¹⁹⁹	61·80 ¹²⁴	58·162 ²³⁵	54·45 ⁷⁵
May 1·1	29·48	63·73 ²⁴⁶	29·908 ¹⁷⁰	63·29 ¹⁴⁹	58·369 ²⁰⁷	55·12 ⁶⁷
11·0	29·77	66·25 ²⁵²	30·048 ¹⁴⁰	64·97 ¹⁶⁸	58·546 ¹⁷⁷	55·71 ⁵⁹
21·0	30·00†	68·77 ²⁵²	30·157† ¹⁰⁹	66·77 ¹⁸⁰	58·692 ¹⁴⁶	56·24 ⁵³
30·9	30·16	71·25 ²⁴⁸	30·234 ⁷⁷	68·61 ¹⁸⁴	58·804 ¹¹²	56·70 ⁴⁶
June 9·9	30·24	73·63 ²³⁸	30·278 ⁴⁴	70·44 ¹⁸³	58·880 ⁷⁶	57·08 ³⁸
19·9	30·24	75·86 ²²³	30·289 ¹¹	72·20 ¹⁷⁶	58·921 ⁴¹	57·40 ³²
29·9	30·16	77·86 ²⁰⁰	30·267 ²²	73·84 ¹⁶⁴	58·925 ⁴	57·64 ²⁴
July 9·9	30·02	79·61 ¹⁷⁵	30·213 ⁵⁴	75·32 ¹⁴⁸	58·893 ³²	57·80 ¹⁶
19·8	29·81	81·04 ¹⁴³	30·130 ⁸³	76·59 ¹²⁷	58·826 ⁶⁷	57·86 ⁶
29·8	29·54	82·11 ¹⁰⁷	30·019 ¹¹¹	77·64 ¹⁰⁵	58·728 ⁹⁸	57·82 ⁴
Aug. 8·8	29·23	82·78 ⁶⁷	29·885 ¹³⁴	78·44 ⁸⁰	58·601 ¹²⁷	57·67 ¹⁵
18·8	28·87	83·02 ²⁴	29·732 ¹⁵³	78·97 ⁵³	58·453 ¹⁴⁸	57·41 ²⁶
28·7	28·50	82·82 ³⁰	29·568 ¹⁶⁴	79·22 ²⁵	58·291 ¹⁶²	57·03 ³⁸
Sept. 7·7	28·12	82·17 ⁶⁵	29·398 ¹⁷⁰	79·18 ⁴	58·123 ¹⁶⁸	56·55 ⁴⁸
17·7	27·75	81·10 ¹⁰⁷	29·232 ¹⁶⁶	78·85 ³³	57·958 ¹⁶⁵	55·97 ⁵⁸
27·6	27·42	79·62 ¹⁴⁸	29·078 ¹⁵⁴	78·22 ⁶³	57·808 ¹⁵⁰	55·32 ⁶⁵
Oct. 7·6	27·15	77·81 ¹⁸¹	28·945 ¹³³	77·28 ⁹⁴	57·682 ¹²⁶	54·64 ⁶⁸
17·6	26·94	75·71 ²¹⁰	28·842 ¹⁰³	76·04 ¹²⁴	57·590 ⁹²	53·96 ⁶⁸
27·6	26·81	73·41 ²³⁰	28·777 ⁶⁵	74·51 ¹⁵³	57·540 ⁵⁰	53·32 ⁶⁴
Nov. 6·5	26·78	71·01 ²⁴⁰	28·756 ²¹	72·71 ¹⁸⁰	57·540 [—]	52·76 ⁵⁶
16·5	26·86	68·60 ²⁴¹	28·783 ²⁷	70·67 ²⁰⁴	57·595 ⁵⁵	52·33 ⁴³
26·5	27·03	66·28 ²³²	28·860 ⁷⁷	68·42 ²²⁵	57·705 ¹¹⁰	52·07 ²⁶
Dec. 6·5	27·31	64·14 ²¹⁴	28·988 ¹²⁸	66·01 ²⁴¹	57·871 ¹⁶⁶	52·00 ⁷
16·4	27·69	62·25 ¹⁸⁹	29·164 ¹⁷⁶	63·51 ²⁵⁰	58·087 ²¹⁶	52·13 ¹³
26·4	28·15	60·70 ¹⁵⁵	29·383 ²¹⁹	60·99 ²⁵²	58·346 ²⁵⁹	52·48 ³⁵
36·4	28·68	59·53 ¹¹⁷	29·637 ²⁵⁴	58·52 ²⁴⁷	58·642 ²⁹⁶	53·02 ⁵⁴
Mean Place	23·756	55·21	26·883	81·21	54·840	41·97
Sec δ, Tan δ	2·220	-1·982	1·040	+0·284	1·112	-0·486
a, a'	+5·3	-10·8	+2·7	-10·5	+3·6	-10·4
b, b'	+0·07	+0·8	-0·01	+0·9	+0·02	+0·9
Authority and Catalogue No.	B.J.	959	A.N.	963	A.N.	964

† Second transit, May 20

† First transit, May 21

APPARENT PLACES OF STARS, 1935

465

AT UPPER TRANSIT AT GREENWICH

Name	δ Scorp̄ii		β ¹ Scorp̄ii		δ Ophiuchi	
Mag. Spect.	2.54	Bo	2.90	Br	3.03	Ma
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 15 ^m 56	— 22° 26'	^h 16 ^m 01	— 19° 37'	^h 16 ^m 10	— 3° 31'
Jan. 1.4	28.949	20.18 83	39.034	47.90 92	55.996	49.22 162
11.4	29.258 309	21.01 96	39.335 301	48.82 103	56.267 271	50.84 158
21.3	29.589 331	21.97 104	39.656 321	49.85 108	56.561 294	52.42 148
31.3	29.932 343	23.01 108	39.991 335	50.93 110	56.870 309	53.90 133
Feb. 10.3	30.279 343	24.09 108	40.331 340	52.03 106	57.185 315	55.23 113
20.3	30.622 333	25.17 104	40.668 328	53.09 99	57.500 308	56.36 89
Mar. 2.2	30.955 319	26.21 98	40.996 315	54.08 89	57.808 296	57.25 62
12.2	31.274 300	27.19 88	41.311 297	54.97 78	58.104 281	57.87 34
22.2	31.574 279	28.07 78	41.608 277	55.75 65	58.385 263	58.21 7
Apr. 1.1	31.853 256	28.85 66	41.885 255	56.40 53	58.648 242	58.28 18
11.1	32.109 230	29.51 57	42.140 229	56.93 40	58.890 219	58.10 40
21.1	32.339 203	30.08 48	42.369 204	57.33 30	59.109 194	57.70 59
May 1.1	32.542 174	30.56 38	42.573 176	57.63 21	59.303 167	57.11 73
11.0	32.716 143	30.94 32	42.749 145	57.84 13	59.470 139	56.38 84
21.0	32.859 111	31.26 25	42.894 114	57.97 6	59.609 109	55.54 91
30.9	32.970 77	31.51 18	43.008 80	58.03 1	59.718 77	54.63 93
June 9.9	33.047 41	31.69 13	43.088 45	58.04 4	59.795 45	53.70 93
19.9	33.088 5	31.82 6	43.133 10	58.00 9	59.840 9	52.77 91
29.9	33.093 30	31.88 —	43.143 25	57.91 12	59.849 23	51.86 84
July 9.9	33.063 63	31.88 6	43.118 60	57.79 16	59.826 55	51.02 77
19.8	33.000 95	31.82 14	43.058 90	57.63 22	59.771 85	50.25 70
29.8	32.905 123	31.68 22	42.968 118	57.41 27	59.686 112	49.55 60
Aug. 8.8	32.782 143	31.46 30	42.850 140	57.14 31	59.574 133	48.95 49
18.8	32.639 158	31.26 38	42.710 155	56.83 37	59.441 150	48.46 39
28.7	32.481 164	30.78 45	42.555 161	56.46 41	59.291 157	48.07 27
Sept. 7.7	32.317 161	30.33 51	42.394 160	56.05 44	59.134 156	47.80 15
17.7	32.156 147	29.82 55	42.234 147	55.61 45	58.978 147	47.65 —
27.7	32.009 124	29.27 56	42.087 125	55.16 44	58.831 128	47.65 15
Oct. 7.6	31.885 90	28.71 52	41.962 94	54.72 39	58.703 100	47.80 32
17.6	31.795 50	28.19 46	41.868 53	54.33 32	58.603 63	48.12 50
27.6	31.745 1	27.73 36	41.815 6	54.01 20	58.540 21	48.62 70
Nov. 6.5	31.744 52	27.37 22	41.809 44	53.81 5	58.519 27	49.32 89
16.5	31.796 105	27.15 5	41.853 99	53.76 11	58.546 76	50.21 108
26.5	31.901 159	27.10 14	41.952 150	53.87 30	58.622 126	51.29 126
Dec. 6.5	32.060 209	27.24 34	42.102 199	54.17 48	58.748 172	52.55 141
16.4	32.269 252	27.58 54	42.301 243	54.65 67	58.920 215	53.96 152
26.4	32.521 288	28.12 71	42.544 279	55.32 82	59.135 251	55.48 159
36.4	32.809	28.83	42.823	56.14	59.386	57.07
Mean Place	29.090	17.07	39.182	44.10	56.170	41.92
Sec δ, Tan δ	1.082	— 0.413	1.062	— 0.357	1.002	— 0.062
a, a'	+3.5	— 10.3	+3.5	— 9.9	+3.1	— 9.2
b, b'	+0.01	+ 0.9	+0.01	+ 0.9	0.00	+ 0.9
Authority and Catalogue No.	B.J.	967	B.J.	972	B.J.	983

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ε Ophiuchi		γ ^a Normæ		σ Scorp̄ii	
Mag. Spect.	3·34	Ko	4·14	Ko	3·10	Br
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 16 14	[°] ['] — 4 32	^h ^m 16 14	[°] ['] — 49 59	^h ^m 16 17	[°] ['] — 25 26
Jan. 1·4	52·551 ²⁷⁰	14·44 ¹⁵⁵	57·487 ⁴⁰²	51·10 ⁶³	13·725 ³⁰⁰	20·69 ⁵⁴
11·4	52·821 ²⁹³	15·99 ¹⁵²	57·889 ⁴³⁷	50·47 ³¹	14·025 ³²⁶	21·23 ⁶⁸
21·3	53·114 ³⁰⁸	17·51 ¹⁴⁴	58·326 ⁴⁶⁰	50·16	14·351 ³⁴³	21·91 ⁷⁹
31·3	53·422 ³¹⁶	18·95 ¹³⁰	58·786 ⁴⁷²	50·16	14·694 ³⁵⁰	22·70 ⁸⁵
Feb. 10·3	53·738 ³¹⁵	20·25 ¹¹¹	59·258 ⁴⁷⁴	50·45 ⁵⁸	15·044 ³⁵⁰	23·55 ⁸⁸
20·3	54·053 ³⁰⁹	21·36 ⁸⁷	59·732 ⁴⁶⁷	51·03 ⁸³	15·394 ³⁴⁴	24·43 ⁸⁸
Mar. 2·2	54·362 ²⁹⁸	22·23 ⁶²	60·199 ⁴⁵²	51·86 ¹⁰⁵	15·738 ³³³	25·31 ⁸⁵
12·2	54·660 ²⁸⁴	22·85 ³⁵	60·651 ⁴³²	52·91 ¹²⁴	16·071 ³¹⁷	26·16 ⁸⁰
22·2	54·944 ²⁶⁶	23·20 ⁹	61·083 ⁴⁰⁷	54·15 ¹⁴⁰	16·388 ²⁹⁹	26·96 ⁷³
Apr. 1·2	55·210 ²⁴⁵	23·29 ¹⁶	61·490 ³⁷⁷	55·55 ¹⁵³	16·687 ²⁷⁸	27·69 ⁶⁶
11·1	55·455 ²²³	23·13 ³⁷	61·867 ³⁴²	57·08 ¹⁶³	16·965 ²⁵³	28·35 ⁵⁹
21·1	55·678 ¹⁹⁹	22·76 ⁵⁵	62·209 ³⁰⁵	58·71 ¹⁷¹	17·218 ²²⁸	28·94 ⁵²
May 1·1	55·877 ¹⁷²	22·21 ⁷⁰	62·514 ²⁶³	60·42 ¹⁷⁶	17·446 ¹⁹⁹	29·46 ⁴⁶
11·0	56·049 ¹⁴⁴	21·51 ⁸⁰	62·777 ²¹⁷	62·18 ¹⁷⁷	17·645 ¹⁶⁸	29·92 ⁴¹
21·0	56·193 ¹¹³	20·71 ⁸⁶	62·994 ¹⁶⁹	63·95 ¹⁷⁷	17·813 ¹³⁵	30·33 ³⁶
30·9	56·306 ⁸²	19·85 ⁹⁰	63·163 ¹¹⁷	65·72 ¹⁷¹	17·948 ⁹⁹	30·69 ³¹
June 9·9	56·388 ⁴⁸	18·95 ⁸⁹	63·280 ⁶⁴	67·43 ¹⁶²	18·047 ⁶²	31·00 ²⁷
19·9	56·436 ¹⁵	18·06 ⁸⁷	63·344 ⁹	69·05 ¹⁴⁹	18·109 ²⁴	31·27 ²²
29·9	56·451 ²⁰	17·19 ⁸¹	63·353 ⁴⁵	70·54 ¹³²	18·133 ¹⁴	31·49 ¹⁶
July 9·9	56·431 ⁵²	16·38 ⁷⁵	63·308 ⁹⁷	71·86 ¹¹⁰	18·119 ⁵¹	31·65 ⁹
19·9	56·379 ⁸³	15·63 ⁶⁸	63·211 ¹⁴⁵	72·96 ⁸⁶	18·068 ⁸⁷	31·74 ¹
29·8	56·296 ¹¹⁰	14·95 ⁵⁸	63·066 ¹⁸⁷	73·82 ⁵⁷	17·981 ¹¹⁷	31·75 ⁸
Aug. 8·8	56·186 ¹³²	14·37 ⁵⁰	62·879 ²²⁰	74·39 ²⁶	17·864 ¹⁴²	31·67 ¹⁸
18·8	56·054 ¹⁴⁸	13·87 ³⁹	62·659 ²⁴³	74·65 ⁷	17·722 ¹⁶⁰	31·49 ²⁷
28·7	55·906 ¹⁵⁷	13·48 ²⁸	62·416 ²⁵⁵	74·58 ⁴⁰	17·562 ¹⁷¹	31·22 ³⁸
Sept. 7·7	55·749 ¹⁵⁷	13·20 ¹⁷	62·161 ²⁵²	74·18 ⁷³	17·391 ¹⁷¹	30·84 ⁴⁶
17·7	55·592 ¹⁴⁹	13·03 ⁴	61·909 ²³⁷	73·45 ¹⁰⁴	17·220 ¹⁶¹	30·38 ⁵⁴
27·7	55·443 ¹²⁹	12·99 ¹¹	61·672 ²⁰⁵	72·41 ¹³¹	17·059 ¹⁴¹	29·84 ⁵⁹
Oct. 7·6	55·314 ¹⁰²	13·10 ²⁷	61·467 ¹⁶¹	71·10 ¹⁵³	16·918 ¹⁰⁹	29·25 ⁶⁰
17·6	55·212 ⁶⁶	13·37 ⁴³	61·306 ¹⁰⁶	69·57 ¹⁷⁰	16·809 ⁶⁹	28·65 ⁵⁸
27·6	55·146 ²⁴	13·80 ⁶³	61·200 ⁴⁰	67·87 ¹⁷⁷	16·740 ²²	28·07 ⁵³
Nov. 6·6	55·122 ²⁴	14·43 ⁸²	61·160 ³³	66·10 ¹⁷⁹	16·718 ³⁰	27·54 ⁴²
16·5	55·146 ⁷³	15·25 ¹⁰⁰	61·193 ¹⁰⁷	64·31 ¹⁷³	16·748 ⁸⁶	27·12 ²⁹
26·5	55·219 ¹²³	16·25 ¹¹⁸	61·300 ¹⁸³	62·58 ¹⁵⁸	16·834 ¹⁴¹	26·83 ¹³
Dec. 6·5	55·342 ¹⁷¹	17·43 ¹³⁴	61·483 ²⁵³	61·00 ¹³⁹	16·975 ¹⁹³	26·70 ⁶
16·4	55·513 ²¹²	18·77 ¹⁴⁵	61·736 ³¹⁶	59·61 ¹¹³	17·168 ²³⁸	26·76 ²⁴
26·4	55·725 ²⁴⁹	20·22 ¹⁵¹	62·052 ³⁷⁰	58·48 ⁸⁴	17·406 ²⁷⁸	27·00 ⁴²
36·4	55·974	21·73	62·422	57·64	17·684	27·42
Mean Place	52·736	07·38	58·037	52·70	13·945	17·87
Sec δ, Tan δ	1·003	— 0·079	1·556	— 1·192	1·107	— 0·476
a, a'	+3·2	— 8·9	+4·5	— 8·9	+3·6	— 8·7
b, b'	0·00	+ 0·9	+0·04	+ 0·9	+0·01	+ 0·9
Authority and Catalogue No.	B.J.	987	B.J.	986	A.N.	989

APPARENT PLACES OF STARS, 1935

467

AT UPPER TRANSIT AT GREENWICH

Name	γ Herculis		η Draconis		γ Apodis	
Mag. Spect.	3.79	Fo	2.89	G5	3.90	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	$16^{\text{h}} 19^{\text{m}}$	$+19^{\circ} 17'$	$16^{\text{h}} 23^{\text{m}}$	$+61^{\circ} 39'$	$16^{\text{h}} 23^{\text{m}}$	$-78^{\circ} 45'$
Jan. 1.4	02.657 ²⁵⁶	64.78 ²⁴⁸	04.35 ³⁶	22.39 ³²³	21.17 ¹⁰⁹	13.48 ¹⁸⁹
11.4	02.913 ²⁸⁴	62.30 ²²⁹	04.71 ³⁹	19.16 ²⁸³	22.26 ¹²¹	11.59 ¹⁴⁵
21.3	03.197 ³⁰²	60.01 ²⁰⁰	05.10 ⁴⁵	16.33 ²³⁴	23.47 ¹³¹	10.14 ⁹⁸
31.3	03.499 ³¹³	58.01 ¹⁶³	05.55 ⁵⁰	13.99 ¹⁷⁶	24.78 ¹³⁸	09.16 ⁴⁹
Feb. 10.3	03.812 ³¹⁵	56.38 ¹²²	06.05 ⁵²	12.23 ¹¹¹	26.16 ¹⁴¹	08.67
20.3	04.127 ³¹²	55.16 ⁷⁷	06.57 ⁵¹	11.12 ⁴⁴	27.57 ¹⁴¹	08.67
Mar. 2.2	04.439 ³⁰¹	54.39 ²⁸	07.08 ⁵¹	10.68 ⁹⁰	28.98 ¹³⁸	09.15 ⁴⁸
12.2	04.740 ²⁸⁶	54.11 ¹⁹	07.59 ⁴⁷	10.92 ²⁴	30.36 ¹³³	10.07 ⁹²
22.2	05.026 ²⁶⁷	54.30 ⁶⁵	08.06 ⁴⁴	11.82 ¹⁵²	31.69 ¹²⁵	11.42 ¹³⁵
Apr. 1.2	05.293 ²⁴⁵	54.95 ¹⁰⁵	08.50 ⁴⁰	13.34 ²⁰⁶	32.94 ¹¹⁵	13.15 ²⁰⁶
11.1	05.538 ²²⁰	56.00 ¹⁴¹	08.90 ³³	15.40 ²⁵²	34.09 ¹⁰⁴	15.21 ²³⁶
21.1	05.758 ¹⁹²	57.41 ¹⁶⁹	09.23 ²⁷	17.92 ²⁸⁷	35.13 ⁹⁰	17.57 ²⁶⁰
May 1.1	05.950 ¹⁶²	59.10 ¹⁹¹	09.50 ²⁰	20.79 ³¹³	36.03 ⁷⁵	20.17 ²⁷⁸
11.0	06.112 ¹³¹	61.01 ²⁰⁵	09.70 ¹²	23.92 ³²⁸	36.78 ⁵⁹	22.95 ²⁹¹
21.0	06.243 ⁹⁸	63.06 ²¹²	09.82 ⁴	27.20 ³³⁰	37.37 ⁴¹	25.86 ²⁹⁶
30.9	06.341 ⁶³	65.18 ²¹²	09.86 ²	30.50 ³²⁵	37.78 ²³	28.82 ²⁹⁵
June 9.9	06.404 ²⁸	67.30 ²⁰⁵	09.84 ¹¹	33.75 ³⁰⁸	38.01 ⁵	31.77 ²⁸⁶
19.9	06.432 ⁸	69.35 ¹⁹²	09.73 ¹⁸	36.83 ²⁸⁴	38.06 ¹⁴	34.63 ²⁷¹
29.9	06.424 ⁴²	71.27 ¹⁷⁶	09.55 ²³	39.67 ²⁵³	37.92 ³²	37.34 ²⁴⁷
July 9.9	06.382 ⁷⁶	73.03 ¹⁵⁵	09.32 ³⁰	42.20 ²¹⁵	37.60 ⁴⁸	39.81 ²¹⁸
19.9	06.306 ¹⁰⁷	74.58 ¹³⁰	09.02 ³⁵	44.35 ¹⁷³	37.12 ⁶⁴	41.99 ¹⁸⁰
29.8	06.199 ¹³⁴	75.88 ¹⁰³	08.67 ³⁹	46.08 ¹²⁷	36.48 ⁷⁷	43.79 ¹³⁷
Aug. 8.8	06.065 ¹⁵⁷	76.91 ⁷⁴	08.28 ⁴³	47.35 ⁷⁷	35.71 ⁸⁷	45.16 ⁸⁹
18.8	05.908 ¹⁷²	77.65 ⁴³	07.85 ⁴⁴	48.12 ²⁷	34.84 ⁹³	46.05 ³⁷
28.7	05.736 ¹⁸²	78.08 ¹²	07.41 ⁴⁶	48.39 ²⁶	33.91 ⁹⁷	46.42 ¹⁷
Sept. 7.7	05.554 ¹⁸¹	78.20 ²²	06.95 ⁴⁵	48.13 ⁷⁷	32.94 ⁹⁶	46.25 ⁷¹
17.7	05.373 ¹⁷³	77.98 ⁵⁴	06.50 ⁴⁴	47.36 ¹²⁹	31.98 ⁹⁰	45.54 ¹²⁴
27.7	05.200 ¹⁵⁶	77.44 ⁸⁸	06.06 ⁴¹	46.07 ¹⁷⁷	31.08 ⁸¹	44.30 ¹⁷³
Oct. 7.6	05.044 ¹²⁸	76.56 ¹²⁰	05.65 ³⁶	44.30 ²²³	30.27 ⁶⁸	42.57 ²¹⁷
17.6	04.916 ⁹³	75.36 ¹⁵¹	05.29 ³⁰	42.07 ²⁶⁵	29.59 ⁵¹	40.40 ²⁵²
27.6	04.823 ⁵¹	73.85 ¹⁸¹	04.99 ²⁴	39.42 ³⁰²	29.08 ³¹	37.88 ²⁷⁹
Nov. 6.6	04.772 ³	72.04 ²⁰⁷	04.75 ¹⁵	36.40 ³³²	28.77 ¹⁰	35.09 ²⁹⁴
16.5	04.769 ⁴⁷	69.97 ²³⁰	04.60 ⁷	33.08 ³⁵⁴	28.67 ¹⁴	32.15 ³⁰⁰
26.5	04.816 ⁹⁸	67.67 ²⁴⁷	04.53 ²	29.54 ³⁶⁸	28.81 ³⁷	29.15 ²⁹³
Dec. 6.5	04.914 ¹⁴⁸	65.20 ²⁵⁸	04.55 ¹²	25.86 ³⁶⁹	29.18 ⁵⁹	26.22 ²⁷⁷
16.4	05.062 ¹⁹³	62.62 ²⁶⁰	04.67 ²¹	22.17 ³⁶¹	29.77 ⁷⁹	23.45 ²⁵⁰
26.4	05.255 ²³³	60.02 ²⁵⁵	04.88 ²⁹	18.56 ³⁴⁰	30.56 ⁹⁸	20.95 ²¹⁶
36.4	05.488	57.47	05.17	15.16	31.54	18.79
Mean Place	03.019	76.46	06.276	39.43	24.892	17.77
Sec δ , Tan δ	1.060	+ 0.350	2.107	+ 1.854	5.128	- 5.030
a, a'	+2.6	- 8.5	+0.8	- 8.2	+9.2	- 8.2
b, b'	-0.01	+ 0.9	-0.05	+ 0.9	+0.14	+ 0.9
Authority and Catalogue No.	B.J.	992	B.J.	1001	B.J.	998

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	α Scorpii (<i>Antares</i>)		β Herculis		λ Ophiuchi <i>m.</i>	
Mag. Spect.	1.22	Ma—A ₃	2.81	Ko	3.85	Ao
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₀ ^m ₂₅	^h ₂₆ ^m ₁₇	^h ₁₆ ^m ₂₇	^h ₂₁ ^m ₃₇	^h ₁₆ ^m ₂₇	^h ₂ ^m ₀₇
Jan. 1.4	24.802 ²⁹⁷	24.14 ⁴⁴	24.981 ²⁵⁰	36.40 ²⁵⁶	37.696 ²⁵⁵	21.65 ¹⁸¹
11.4	25.099 ³²³	24.58 ⁵⁸	25.231 ²⁷⁸	33.84 ²³⁶	37.951 ²⁸⁰	19.84 ¹⁷⁴
21.4	25.422 ³⁴¹	25.16 ⁶⁹	25.509 ²⁹⁹	31.48 ²⁰⁶	38.231 ²⁹⁷	18.10 ¹⁵⁹
31.3	25.763 ³⁵⁰	25.85 ⁷⁷	25.808 ³¹²	29.42 ¹⁶⁹	38.528 ³⁰⁷	16.51 ¹³⁸
Feb. 10.3	26.113 ³⁵²	26.62 ⁸¹	26.120 ³¹⁶	27.73 ¹²⁶	38.835 ³⁰⁹	15.13 ¹¹³
20.3	26.465 ³⁴⁷	27.43 ⁸¹	26.436 ³¹⁴	26.47 ⁷⁸	39.144 ³⁰⁶	14.00 ⁸⁴
Mar. 2.2	26.812 ³³⁷	28.24 ⁷⁸	26.750 ³⁰⁶	25.69 ²⁸	39.450 ²⁹⁸	13.16 ⁵²
12.2	27.149 ³²³	29.02 ⁷⁵	27.056 ²⁹¹	25.41 ²¹	39.748 ²⁸⁵	12.64 ¹⁸
22.2	27.472 ³⁰⁶	29.77 ⁶⁹	27.347 ²⁷⁴	25.62 ⁶⁸	40.033 ²⁶⁸	12.46 ¹⁴
Apr. 1.2	27.778 ²⁸⁵	30.46 ⁶³	27.621 ²⁵¹	26.30 ¹¹¹	40.301 ²⁴⁹	12.60 ⁴³
11.1	28.063 ²⁶³	31.09 ⁵⁷	27.872 ²²⁷	27.41 ¹⁴⁸	40.550 ²²⁸	13.03 ⁶⁹
21.1	28.326 ²³⁷	31.66 ⁵²	28.099 ¹⁹⁹	28.89 ¹⁷⁹	40.778 ²⁰³	13.72 ⁹¹
May 1.1	28.563 ²⁰⁸	32.18 ⁴⁷	28.298 ¹⁷⁰	30.68 ²⁰²	40.981 ¹⁷⁸	14.63 ¹⁰⁹
11.1	28.771 ¹⁷⁸	32.65 ⁴²	28.468 ¹³⁸	32.70 ²¹⁶	41.159 ¹⁵⁰	15.72 ¹²¹
21.0	28.949 ¹⁴⁵	33.07 ³⁸	28.606 ¹⁰⁴	34.86 ²²⁵	41.309 ¹²⁰	16.93 ¹²⁷
30.9	29.094 ¹⁰⁸	33.45 ³⁵	28.710 ⁶⁹	37.11 ²²⁴	41.429 ⁸⁷	18.20 ¹³⁰
June 9.9	29.202 ⁷¹	33.80 ³¹	28.779 ³²	39.35 ²¹⁸	41.516 ⁵⁴	19.50 ¹²⁷
19.9	29.273 ³²	34.11 ²⁵	28.811 ⁴	41.53 ²⁰⁷	41.570 ²⁰	20.77 ¹²³
29.9	29.305 ⁸	34.36 ²¹	28.807 ⁴⁰	43.60 ¹⁸⁸	41.590 ¹⁵	22.00 ¹¹⁴
July 9.9	29.297 ⁴⁶	34.57 ¹⁴	28.767 ⁷⁵	45.48 ¹⁶⁶	41.575 ⁴⁹	23.14 ¹⁰²
19.9	29.251 ⁸²	34.71 ⁷	28.692 ¹⁰⁸	47.14 ¹⁴¹	41.526 ⁸⁰	24.16 ⁹⁰
29.8	29.169 ¹¹⁵	34.78 ³	28.584 ¹³⁶	48.55 ¹¹²	41.446 ¹⁰⁹	25.06 ⁷⁶
Aug. 8.8	29.054 ¹⁴²	34.75 ¹²	28.448 ¹⁶⁰	49.67 ⁸¹	41.337 ¹³²	25.82 ⁶⁰
18.8	28.912 ¹⁶²	34.63 ²³	28.288 ¹⁷⁷	50.48 ⁴⁸	41.205 ¹⁵⁰	26.42 ⁴³
28.8	28.750 ¹⁷³	34.40 ³⁴	28.111 ¹⁸⁷	50.96 ¹⁶	41.055 ¹⁶⁰	26.85 ²⁶
Sept. 7.7	28.577 ¹⁷⁴	34.06 ⁴⁴	27.924 ¹⁸⁹	51.12 ²⁰	40.895 ¹⁶³	27.11 ⁸
17.7	28.403 ¹⁶⁶	33.62 ⁵²	27.735 ¹⁸²	50.92 ⁵⁴	40.732 ¹⁵⁶	27.19 ¹¹
27.7	28.237 ¹⁴⁶	33.10 ⁵⁹	27.553 ¹⁶⁶	50.38 ⁸⁹	40.576 ¹⁴⁰	27.08 ³¹
Oct. 7.6	28.091 ¹¹⁶	32.51 ⁶¹	27.387 ¹³⁸	49.49 ¹²³	40.436 ¹¹⁴	26.77 ⁵²
17.6	27.975 ⁷⁷	31.90 ⁶¹	27.249 ¹⁰⁴	48.26 ¹⁵⁶	40.322 ⁸⁰	26.25 ⁷³
27.6	27.898 ³⁰	31.29 ⁵⁷	27.145 ⁶²	46.70 ¹⁸⁷	40.242 ³⁹	25.52 ⁹⁵
Nov. 6.6	27.868 ²³	30.72 ⁴⁷	27.083 ¹⁵	44.83 ²¹⁵	40.203 ⁶	24.57 ¹¹⁵
16.5	27.891 ⁷⁸	30.25 ³⁶	27.068 ³⁵	42.68 ²³⁷	40.209 ⁵⁵	23.42 ¹³⁶
26.5	27.969 ¹³³	29.89 ²¹	27.103 ⁸⁷	40.31 ²⁵⁶	40.264 ¹⁰⁵	22.06 ¹⁵⁴
Dec. 6.5	28.102 ¹⁸⁵	29.68 ³	27.190 ¹³⁸	37.75 ²⁶⁶	40.369 ¹⁵²	20.52 ¹⁶⁸
16.5	28.287 ²³³	29.65 ¹⁵	27.328 ¹⁸⁴	35.09 ²⁶⁹	40.521 ¹⁹⁵	18.84 ¹⁷⁶
26.4	28.520 ²⁷³	29.80 ³³	27.512 ²²⁵	32.40 ²⁶⁴	40.716 ²³³	17.08 ¹⁸⁰
36.4	28.793	30.13	27.737	29.76	40.949	15.28
Mean Place	25.049	21.35	25.407	48.15	37.948	29.86
Sec δ , Tan δ	1.115	-0.494	1.076	+0.397	1.001	+0.037
<i>a</i> , <i>a'</i>	+3.7	-8.0	+2.6	-7.9	+3.0	-7.9
<i>b</i> , <i>b'</i>	+0.01	+0.9	-0.01	+0.9	0.00	+0.9
Authority and Catalogue No.	B.J.	1002	B.J.	1005	A.N.	1006

† Second transit, May 30

APPARENT PLACES OF STARS, 1935

469

AT UPPER TRANSIT AT GREENWICH

Name	τ Scorpii		ζ Ophiuchi		24 Scorpii	
	2.91	Bo	2.70	Bo	5.04	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 16 ^m 31	[°] −28 ['] 04	^h 16 ^m 33	[°] −10 ['] 26	^h 16 ^m 37	[°] −17 ['] 37
Jan. 1.4	49.600	60.38	34.359	18.59	48.337	08.85
11.4	49.895	60.68	34.622	19.78	48.607	09.65
21.4	50.219	61.13	34.910	20.99	48.903	10.52
31.3	50.562	61.70	35.216	22.18	49.218	11.43
Feb. 10.3	50.915	62.37	35.532	23.28	49.544	12.33
20.3	51.271	63.09	35.851	24.25	49.873	13.17
Mar. 2.2	51.624	63.83	36.167	25.05	50.200	13.92
12.2	51.968	64.58	36.475	25.67	50.520	14.56
22.2	52.299	65.31	36.771	26.08	50.828	15.07
Apr. 1.2	52.613	66.00	37.051	26.28	51.122	15.44
11.1	52.907	66.64	37.314	26.28	51.397	15.68
21.1	53.179	67.24	37.556	26.10	51.652	15.80
May 1.1	53.425	67.81	37.776	25.78	51.884	15.82
11.1	53.643	68.34	37.970	25.34	52.090	15.75
21.0	53.830	68.83	38.136	24.81	52.268	15.61
31.0	53.983†	69.29	38.273†	24.23	52.415	15.44
June 9.9	54.100	69.73	38.376	23.62	52.528	15.24
19.9	54.178	70.13	38.445	23.00	52.606	15.02
29.9	54.215	70.49	38.479	22.39	52.647	14.79
July 9.9	54.213	70.79	38.476	21.81	52.649	14.56
19.9	54.171	71.02	38.438	21.27	52.615	14.33
29.8	54.091	71.16	38.366	20.78	52.546	14.10
Aug. 8.8	53.978	71.21	38.264	20.33	52.444	13.86
18.8	53.836	71.15	38.136	19.92	52.315	13.60
28.8	53.673	70.97	37.989	19.56	52.166	13.32
Sept. 7.7	53.497	70.67	37.830	19.26	52.003	13.03
17.7	53.318	70.25	37.668	19.02	51.836	12.72
27.7	53.147	69.72	37.512	18.85	51.675	12.41
Oct. 7.6	52.994	69.11	37.372	18.76	51.531	12.13
17.6	52.871	68.45	37.259	18.78	51.412	11.88
27.6	52.787	67.77	37.179	18.92	51.329	11.69
Nov. 6.6	52.751	67.12	37.142	19.20	51.289	11.59
16.5	52.766	66.54	37.151	19.63	51.297	11.60
26.5	52.838	66.06	37.211	20.23	51.357	11.75
Dec. 6.5	52.966	65.72	37.321	20.99	51.468	12.06
16.5	53.147	65.55	37.479	21.91	51.630	12.51
26.4	53.377	65.55	37.681	22.96	51.837	13.11
36.4	53.649	65.73	37.921	24.09	52.083	13.84
Mean Place	49.874	57.79	34.591	12.80	48.584	04.33
Sec δ, Tan δ	1.133	− 0.533	1.017	− 0.184	1.049	− 0.318
a, a'	+3.7	− 7.5	+3.3	− 7.4	+3.5	− 7.0
b, b'	+0.01	+ 0.9	0.00	+ 0.9	+0.01	+ 0.9
Authority and Catalogue No.	A.N.	1008	B.J.	1013	A.N.	1016

† First transit, May 31

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ζ Herculis (<i>Brighter Star</i>)		η Herculis		α Trianguli Australis	
Mag. Spect.	3.00	Go	3.61	Ko	1.88	K2
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	$16^{\text{h}} 38^{\text{m}}$	$+31^{\circ} 42'$	$16^{\text{h}} 40^{\text{m}}$	$+39^{\circ} 02'$	$16^{\text{h}} 41^{\text{m}}$	$-68^{\circ} 54'$
Jan. 1.4	49.392 ²⁴²	57.56 ²⁸⁶	39.062 ²⁴⁸	27.89 ³⁰⁷	44.15 ⁵⁹	37.36 ¹⁷⁵
11.4	49.634 ²⁷⁶	54.70 ²⁶¹	39.310 ²⁸⁶	24.82 ²⁷⁸	44.74 ⁶⁸	35.61 ¹³⁷
21.4	49.910 ³⁰²	52.09 ²²⁷	39.596 ³¹⁷	22.04 ²³⁹	45.42 ⁷³	34.24 ⁹⁷
31.3	50.212 ³²⁰	49.82 ¹⁸²	39.913 ³³⁸	19.65 ¹⁹²	46.15 ⁷⁷	33.27 ⁵⁶
Feb. 10.3	50.532 ³²⁹	48.00 ¹³³	40.251 ³⁴⁹	17.73 ¹³⁸	46.92 ⁸⁰	32.71 ¹⁴
20.3	50.861 ³³⁰	46.67 ⁷⁹	40.600 ³⁵²	16.35 ⁷⁸	47.72 ⁷⁹	32.57 ²⁷
Mar. 2.3	51.191 ³²⁴	45.88 ²²	40.952 ³⁴⁶	15.57 ¹⁸	48.51 ⁷⁹	32.84 ⁶⁶
12.2	51.515 ³¹¹	45.66 ³⁴	41.298 ³³³	15.39 ⁴³	49.30 ⁷⁶	33.50 ¹⁰²
22.2	51.826 ²⁹³	46.00 ⁸⁸	41.631 ³¹⁴	15.82 ¹⁰⁰	50.06 ⁷³	34.52 ¹³⁶
Apr. 1.2	52.119 ²⁷⁰	46.88 ¹³⁷	41.945 ²⁸⁷	16.82 ¹⁵³	50.79 ⁶⁸	35.88 ¹⁶⁵
11.1	52.389 ²⁴⁴	48.25 ¹⁸⁰	42.232 ²⁵⁹	18.35 ¹⁹⁹	51.47 ⁶³	37.53 ¹⁹²
21.1	52.633 ²¹³	50.05 ²¹⁵	42.491 ²²⁵	20.34 ²³⁵	52.10 ⁵⁶	39.45 ²¹⁴
May 1.1	52.846 ¹⁸⁰	52.20 ²⁴¹	42.716 ¹⁸⁷	22.69 ²⁶³	52.66 ⁴⁸	41.59 ²³²
11.1	53.026 ¹⁴⁵	54.61 ²⁶⁰	42.903 ¹⁴⁶	25.32 ²⁸³	53.14 ⁴¹	43.91 ²⁴⁵
21.0	53.171 ¹⁰⁷	57.21 ²⁶⁹	43.049 ¹⁰⁵	28.15 ²⁹¹	53.55 ³¹	46.36 ²⁵³
31.0	53.278 ⁶⁷	59.90 ²⁶⁹	43.154 ⁶⁰	31.06 ²⁹¹	53.86 ²²	48.89 ²⁵⁴
June 9.9	53.345 ²⁷	62.59 ²⁶²	43.214 ¹⁶	33.97 ²⁸³	54.08 ¹¹	51.43 ²⁵⁰
19.9	53.372 ¹³	65.21 ²⁴⁷	43.230 ²⁸	36.80 ²⁶⁷	54.19 ²	53.93 ²³⁸
29.9	53.359 ⁵⁵	67.68 ²²⁷	43.202 ⁷³	39.47 ²⁴⁴	54.21 ⁹	56.31 ²²²
July 9.9	53.304 ⁹²	69.95 ²⁰¹	43.129 ¹¹⁴	41.91 ²¹⁵	54.12 ¹⁸	58.53 ¹⁹⁸
19.9	53.212 ¹²⁸	71.96 ¹⁷⁰	43.015 ¹⁵²	44.06 ¹⁸²	53.94 ²⁷	60.51 ¹⁶⁸
29.8	53.084 ¹⁵⁹	73.66 ¹³⁵	42.863 ¹⁸⁶	45.88 ¹⁴⁴	53.67 ³⁶	62.19 ¹³¹
Aug. 8.8	52.925 ¹⁸⁵	75.01 ⁹⁹	42.677 ²¹³	47.32 ¹⁰³	53.31 ⁴²	63.50 ⁹¹
18.8	52.740 ²⁰⁵	76.00 ⁶¹	42.464 ²³⁴	48.35 ⁶⁰	52.89 ⁴⁶	64.41 ⁴⁷
28.8	52.535 ²¹⁷	76.61 ¹⁹	42.230 ²⁴⁸	48.95 ¹⁶	52.43 ⁵⁰	64.88 ²
Sept. 7.7	52.318 ²²¹	76.80 ²²	41.982 ²⁵⁰	49.11 ³⁰	51.93 ⁵⁰	64.86 ⁴⁹
17.7	52.097 ²¹⁵	76.58 ⁶⁴	41.732 ²⁴⁴	48.81 ⁷⁴	51.43 ⁴⁸	64.37 ⁹⁷
27.7	51.882 ¹⁹⁸	75.94 ¹⁰⁵	41.488 ²²⁸	48.07 ¹²⁰	50.95 ⁴⁴	63.40 ¹⁴²
Oct. 7.7	51.684 ¹⁷³	74.89 ¹⁴³	41.260 ²⁰⁰	46.87 ¹⁶³	50.51 ³⁸	61.98 ¹⁸²
17.6	51.511 ¹³⁸	73.46 ¹⁸²	41.060 ¹⁶³	45.24 ²⁰³	50.13 ²⁸	60.16 ²¹⁵
27.6	51.373 ⁹⁵	71.64 ²¹⁸	40.897 ¹¹⁷	43.21 ²⁴¹	49.85 ¹⁸	58.01 ²⁴¹
Nov. 6.6	51.278 ⁴⁶	69.46 ²⁴⁸	40.780 ⁶⁶	40.80 ²⁷³	49.67 ⁶	55.60 ²⁵⁸
16.5	51.232 ⁷	66.98 ²⁷³	40.714 ⁸	38.07 ²⁹⁹	49.61 ⁶	53.02 ²⁶⁴
26.5	51.239 ⁶²	64.25 ²⁹²	40.706 ⁵⁰	35.08 ³¹⁸	49.67 ¹⁹	50.38 ²⁶⁰
Dec. 6.5	51.301 ¹¹⁷	61.33 ³⁰³	40.756 ¹⁰⁹	31.90 ³²⁹	49.86 ³²	47.78 ²⁴⁸
16.5	51.418 ¹⁶⁹	58.30 ³⁰⁴	40.865 ¹⁶⁶	28.61 ³²⁸	50.18 ⁴⁴	45.30 ²²⁶
26.4	51.587 ²¹⁴	55.26 ²⁹⁶	41.031 ²¹⁶	25.33 ³¹⁷	50.62 ⁵⁴	43.04 ¹⁹⁸
36.4	51.801	52.30	41.247	22.16	51.16	41.06
Mean Place	50.022	70.14	39.905	41.41	45.846	39.89
Sec δ , Tan δ	1.176	+ 0.618	1.288	+ 0.811	2.779	- 2.593
a, a'	+2.3	- 7.0	+2.1	- 6.8	+6.3	- 6.7
b, b'	-0.01	+ 0.9	-0.02	+ 0.9	+0.06	+ 0.9
Authority and Catalogue No.	A.N.	1017	B.J.	1018	B.J.	1019

No. 1017. The reductions from $c.g.$ to brighter star vary during the year from $+0^{\circ}.017$, $+0^{\circ}.12$ to $+0^{\circ}.016$, $+0^{\circ}.19$. The mean place is that of $c.g.$

APPARENT PLACES OF STARS, 1935

471

AT UPPER TRANSIT AT GREENWICH

Name	ε Scorpii		20 Ophiuchi		μ ¹ Scorpii	
	2.36	Ko	4.73	F5	3.09	B3p
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	16 ^h 45 ^m	—34° 10'	16 ^h 46 ^m	—10° 40'	16 ^h 47 ^m	—37° 56'
Jan. 1.4	56.587 ²⁹⁹	38.57	13.816 ²⁵³	16.08	27.322 ³¹¹	16.60
11.4	56.886 ³³²	38.45 ¹²	14.069 ²⁸⁰	17.20 ¹¹²	27.633 ³⁴⁵	16.26 ³⁴
21.4	57.218 ³⁵³	38.51 ⁶	14.349 ³⁰⁰	18.34 ¹¹⁴	27.978 ³⁶⁹	16.12 ¹⁴
31.3	57.571 ³⁶⁸	38.74 ²³	14.649 ³¹²	19.45 ¹¹¹	28.347 ³⁸⁴	16.18 ⁶
Feb. 10.3	57.939 ³⁷³	39.10 ³⁶	14.961 ³¹⁷	20.49 ¹⁰⁴	28.731 ³⁹¹	16.41 ²³
20.3	58.312 ³⁷³	39.59 ⁴⁹	15.278 ³¹⁶	21.40 ⁹¹	29.122 ³⁹¹	16.79 ³⁸
Mar. 2.3	58.685 ³⁶⁷	40.16 ⁵⁷	15.594 ³⁰⁹	22.15 ⁷⁵	29.513 ³⁸⁵	17.30 ⁵¹
12.2	59.052 ³⁵⁵	40.79 ⁶³	15.903 ³⁰⁰	22.71 ⁵⁶	29.898 ³⁷³	17.92 ⁶²
22.2	59.407 ³⁴⁰	41.47 ⁶⁸	16.203 ²⁸⁷	23.07 ³⁶	30.271 ³⁵⁸	17.92 ⁷¹
Apr. 1.2	59.747 ³²¹	42.19 ⁷²	16.490 ²⁷¹	23.23 ¹⁶	30.629 ³³⁹	18.63 ⁷⁷
11.1	60.068 ²⁹⁹	42.92 ⁷³	16.761 ²⁵¹	23.19 ²¹	30.968 ³¹⁴	19.40 ⁸³
21.1	60.367 ²⁷⁴	43.66 ⁷⁴	17.012 ²³⁰	22.98 ³⁶	31.282 ²⁸⁸	20.23 ⁸⁷
May 1.1	60.641 ²⁴⁴	44.42 ⁷⁶	17.242 ²⁰⁵	22.62 ⁴⁷	31.570 ²⁵⁸	21.10 ⁹¹
11.1	60.885 ²¹³	45.19 ⁷⁷	17.447 ¹⁷⁸	22.15 ⁵⁶	31.828 ²²³	22.01 ⁹⁴
21.0	61.098 ¹⁷⁶	45.96 ⁷⁷	17.625 ¹⁴⁸	21.59 ⁶¹	32.051 ¹⁸⁶	22.95 ⁹⁶
31.0	61.274 ¹³⁷	46.73 ⁷⁶	17.773 ¹¹⁵	20.98 ⁶⁴	32.237 ¹⁴⁵	23.91 ⁹⁷
June 9.9	61.411 ⁹⁶	47.49 ⁷³	17.888 ⁸¹	20.34 ⁶⁴	32.382 ¹⁰¹	24.88 ⁹⁶
19.9	61.507 ⁵²	48.22 ⁶⁹	17.969 ⁴⁵	19.70 ⁶¹	32.483 ⁵⁵	25.84 ⁹⁴
29.9	61.559 ⁶	48.91 ⁶³	18.014 ⁷	19.09 ⁵⁸	32.538 ⁸	26.78 ⁸⁹
July 9.9	61.565 ³⁶	49.54 ⁵⁵	18.021 ²⁹	18.51 ⁵⁵	32.546 ³⁷	27.67 ⁸²
19.9	61.529 ⁷⁹	50.09 ⁴⁴	17.992 ⁶⁴	17.96 ⁴⁹	32.509 ⁸²	28.49 ⁷¹
29.8	61.450 ¹¹⁸	50.53 ³⁰	17.928 ⁹⁶	17.47 ⁴⁴	32.509 ⁸²	29.20 ⁵⁹
Aug. 8.8	61.332 ¹⁴⁹	50.83 ¹⁶	17.832 ¹²³	17.03 ³⁹	32.427 ¹²²	29.79 ⁴³
18.8	61.183 ¹⁷⁵	50.99 ²	17.709 ¹⁴⁵	16.64 ³⁴	32.305 ¹⁵⁶	30.22 ²⁵
28.8	61.008 ¹⁹¹	50.97 ¹⁹	17.564 ¹⁵⁹	16.30 ²⁹	32.149 ¹⁸³	30.47 ⁵
Sept. 7.7	60.817 ¹⁹⁶	50.78 ³⁸	17.405 ¹⁶⁴	16.01 ²²	31.966 ²⁰⁰	30.52 ¹⁷
17.7	60.621 ¹⁹¹	50.40 ⁵⁵	17.241 ¹⁶⁰	15.79 ¹⁶	31.766 ²⁰⁶	30.35 ³⁹
27.7	60.430 ¹⁷³	49.85 ⁶⁹	17.081 ¹⁴⁶	15.63 ⁸	31.560 ²⁰⁰	29.96 ⁵⁹
Oct. 7.7	60.257 ¹⁴⁴	49.16 ⁸¹	16.935 ¹²¹	15.55 ¹	31.360 ¹⁸²	29.37 ⁷⁸
17.6	60.113 ¹⁰⁴	48.35 ⁹⁰	16.814 ⁸⁹	15.56 ¹³	31.178 ¹⁵²	28.59 ⁹³
27.6	60.009 ⁵⁶	47.45 ⁹²	16.725 ⁴⁸	15.69 ²⁶	31.026 ¹¹¹	27.66 ¹⁰⁵
Nov. 6.6	59.953 [—]	46.53 ⁹²	16.677 ²	15.95 ⁴⁰	30.915 ⁶⁰	26.61 ¹¹¹
16.5	59.953 ⁵⁷	45.61 ⁸⁵	16.675 ⁴⁷	16.35 ⁵⁶	30.855 ³	25.50 ¹¹³
26.5	60.010 ¹¹⁷	44.76 ⁷⁵	16.722 ⁹⁸	16.91 ⁷¹	30.852 ⁵⁸	24.37 ¹⁰⁸
Dec. 6.5	60.127 ¹⁷⁴	44.01 ⁶⁰	16.820 ¹⁴⁶	17.62 ⁸⁶	30.910 ¹²⁰	23.29 ⁹⁸
16.5	60.301 ²²⁶	43.41 ⁴³	16.966 ¹⁹⁰	18.48 ⁹⁸	31.030 ¹⁸⁰	22.31 ⁸⁵
26.4	60.527 ²⁷²	42.98 ²⁶	17.156 ²³⁰	19.46 ¹⁰⁷	31.210 ²³⁵	21.46 ⁶⁸
36.4	60.799	42.72	17.386	20.53	31.445 ²⁸²	20.78 ⁴⁸
					31.727	20.30
Mean Place	56.944	36.66	14.080	10.36	27.726	15.20
Secδ, Tanδ	1.209	— 0.679	1.018	— 0.188	1.268	— 0.780
a, a'	+3.9	— 6.4	+3.3	— 6.3	+4.1	— 6.2
b, b'	+0.01	+ 0.9	0.00	+ 0.9	+0.02	+ 1.0
Authority and Catalogue No.	B.J.	1023	A.N.	1024	A.N.	1026

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ζ Aræ		κ Ophiuchi		30 Ophiuchi	
	3.06	K5	3.42	Ko	5.00	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 16 ^m 53	— [°] 55 ['] 53	^h 16 ^m 54	+ [°] 9 ['] 28	^h 16 ^m 57	— [°] 4 ['] 07
Jan. 1.4	13.150	21.56	34.974	20.39	37.444	41.99
11.4	13.553	20.27	35.203	18.31	37.681	43.40
21.4	14.004	19.27	35.461	16.35	37.946	44.79
31.3	14.492	18.58	35.741	14.57	38.232	46.10
Feb. 10.3	15.006	18.22	36.035	13.05	38.531	47.27
20.3	15.533	18.15	36.337	11.85	38.837	48.26
Mar. 2.3	16.064	18.38	36.641	11.01	39.144	49.00
12.2	16.589	18.91	36.940	10.56	39.448	49.50
22.2	17.101	19.69	37.231	10.50	39.742	49.74
Apr. 1.2	17.594	20.71	37.509	10.84	40.027	49.67
11.2	18.060	21.93	37.771	11.54	40.298	49.39
21.1	18.493	23.35	38.015	12.56	40.550	48.88
May 1.1	18.889	24.94	38.237	13.85	40.781	48.17
11.1	19.241	26.66	38.433	15.36	40.990	47.31
21.0	19.543	28.48	38.602	17.01	41.171	46.35
31.0	19.790	30.37	38.741	18.75	41.324	45.34
June 9.9	19.978	32.29	38.846	20.51	41.444	44.29
19.9	20.103	34.18	38.917	22.25	41.531	43.26
29.9	20.163	36.01	38.951	23.93	41.582	42.27
July 9.9	20.156	37.72	38.949	25.49	41.593	41.32
19.9	20.083	39.26	38.910	26.89	41.569	40.48
29.9	19.949	40.57	38.837	28.12	41.508	39.73
Aug. 8.8	19.759	41.62	38.732	29.15	41.417	39.08
18.8	19.521	42.35	38.600	29.96	41.296	38.53
28.8	19.246	42.74	38.446	30.54	41.152	38.10
Sept. 7.7	18.948	42.75	38.277	30.88	40.993	37.80
17.7	18.642	42.38	38.103	30.97	40.827	37.62
27.7	18.343	41.63	37.932	30.80	40.665	37.56
Oct. 7.7	18.068	40.53	37.771	30.38	40.515	37.63
17.6	17.833	39.12	37.634	29.69	40.385	37.87
27.6	17.655	37.44	37.527	28.74	40.287	38.26
Nov. 6.6	17.543	35.55	37.458	27.54	40.228	38.83
16.6	17.510	33.55	37.433	26.09	40.212	39.57
26.5	17.559	31.50	37.456	24.42	40.244	40.49
Dec. 6.5	17.693	29.49	37.527	22.56	40.325	41.55
16.5	17.909	27.59	37.647	20.57	40.455	42.77
26.4	18.202	25.87	37.811	18.49	40.626	44.11
36.4	18.563	24.39	38.015	16.40	40.840	45.48
Mean Place	13.992	22.23	35.359	29.16	37.751	35.33
Secδ, Tanδ	1.783	— 1.476	1.014	+ 0.167	1.003	— 0.072
a, a'	+5.0	— 5.8	+2.9	— 5.6	+3.2	— 5.4
b, b'	+0.03	+ 1.0	0.00	+ 1.0	0.00	+ 1.0
Authority and Catalogue No.	B.J.	1031	B.J.	1034	A.E.	1035

APPARENT PLACES OF STARS, 1935

473

AT UPPER TRANSIT AT GREENWICH

Name	ε Herculis		η Ophiuchi <i>m</i> .		η Scorpii	
	3·92	Ao	2·63	A2	3·44	F2
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 16 ^m 57	+31° 00'	^h 17 ^m 06	−15° 38'	^h 17 ^m 07	−43° 09'
Jan. 1·4	47·295 ²²⁴	64·15 ²⁸⁹	38·548 ²⁴³	50·36 ⁷⁶	29·008 ³¹⁰	20·43 ⁷⁷
11·4	47·519 ²⁶¹	61·26 ²⁶⁶	38·791 ²⁷³	51·12 ⁸⁰	29·318 ³⁵⁰	19·66 ⁵⁷
21·4	47·780 ²⁸⁹	58·60 ²³⁴	39·064 ²⁹⁶	51·92 ⁸¹	29·668 ³⁸⁰	19·09 ³⁵
31·4	48·069 ³⁰⁹	56·26 ¹⁹²	39·360 ³¹⁰	52·73 ⁷⁷	30·048 ⁴⁰¹	18·74 ¹⁵
Feb. 10·3	48·378 ³²²	54·34 ¹⁴⁵	39·670 ³¹⁸	53·50 ⁷⁰	30·449 ⁴¹²	18·59 ⁴
20·3	48·700 ³²⁷	52·89 ⁹²	39·988 ³²¹	54·20 ⁵⁹	30·861 ⁴¹⁸	18·63 ²²
Mar. 2·3	49·027 ³²⁵	51·97 ³⁵	40·309 ³¹⁹	54·79 ⁴⁶	31·279 ⁴¹⁵	18·85 ³⁸
12·2	49·352 ³¹⁵	51·62 ²¹	40·628 ³¹²	55·25 ³⁰	31·694 ⁴⁰⁷	19·23 ⁵²
22·2	49·667 ³⁰²	51·83 ⁷⁵	40·940 ³⁰¹	55·55 ¹⁵	32·101 ³⁹⁴	19·75 ⁶⁵
Apr. 1·2	49·969 ²⁸²	52·58 ¹²⁶	41·241 ²⁸⁸	55·70 ¹	32·495 ³⁷⁷	20·40 ⁷⁶
11·2	50·251 ²⁵⁹	53·84 ¹⁷⁰	41·529 ²⁷¹	55·71 ¹²	32·872 ³⁵⁵	21·16 ⁸⁷
21·1	50·510 ²³¹	55·54 ²⁰⁸	41·800 ²⁵²	55·59 ²³	33·227 ³²⁸	22·03 ⁹⁶
May 1·1	50·741 ²⁰⁰	57·62 ²³⁶	42·052 ²²⁸	55·36 ³²	33·555 ²⁹⁷	22·99 ¹⁰⁵
11·1	50·941 ¹⁶⁶	59·98 ²⁵⁷	42·280 ²⁰³	55·04 ³⁷	33·852 ²⁶²	24·04 ¹¹¹
21·1	51·107 ¹²⁸	62·55 ²⁶⁸	42·483 ¹⁷²	54·67 ⁴¹	34·114 ²²²	25·15 ¹¹⁶
31·0	51·235 ⁸⁹	65·23 ²⁷²	42·655 ¹³⁹	54·26 ⁴¹	34·336 ¹⁷⁸	26·31 ¹¹⁹
June 9·9	51·324 ⁴⁹	67·95 ²⁶⁶	42·794 ¹⁰⁴	53·85 ⁴⁰	34·514 ¹³⁰	27·50 ¹²⁰
19·9	51·373 ⁶	70·61 ²⁵⁵	42·898 ⁶⁷	53·45 ⁴⁰	34·644 ⁷⁹	28·70 ¹¹⁸
29·9	51·379 ³⁵	73·16 ²³⁶	42·965 ²⁶	53·05 ³⁶	34·723 ²⁷	29·88 ¹¹²
July 9·9	51·344 ⁷⁴	75·52 ²¹²	42·991 ¹³	52·69 ³³	34·750 ²⁵	31·00 ¹⁰²
19·9	51·270 ¹¹³	77·64 ¹⁸³	42·978 ⁵¹	52·36 ³⁰	34·725 ⁷⁴	32·02 ⁸⁹
29·9	51·157 ¹⁴⁷	79·47 ¹⁵⁰	42·927 ⁸⁶	52·06 ²⁷	34·651 ¹²¹	32·91 ⁷³
Aug. 8·8	51·010 ¹⁷⁶	80·97 ¹¹⁵	42·841 ¹¹⁸	51·79 ²⁶	34·530 ¹⁶²	33·64 ⁵²
18·8	50·834 ¹⁹⁹	82·12 ⁷⁶	42·723 ¹⁴²	51·53 ²⁵	34·368 ¹⁹⁴	34·16 ²⁹
28·8	50·635 ²¹⁵	82·88 ³⁶	42·581 ¹⁶⁰	51·28 ²³	34·174 ²¹⁶	34·45 ⁴
Sept. 7·8	50·420 ²²⁰	83·24 ⁴	42·421 ¹⁶⁹	51·05 ²³	33·958 ²²⁷	34·49 ²³
17·7	50·200 ²¹⁸	83·20 ⁴⁶	42·252 ¹⁶⁸	50·82 ²¹	33·731 ²²⁶	34·26 ⁴⁸
27·7	49·982 ²⁰⁵	82·74 ⁸⁷	42·084 ¹⁵⁵	50·61 ¹⁸	33·505 ²¹⁰	33·78 ⁷⁴
Oct. 7·7	49·777 ¹⁸²	81·87 ¹²⁷	41·929 ¹³⁵	50·43 ¹⁴	33·295 ¹⁸²	33·04 ⁹⁶
17·6	49·595 ¹⁵¹	80·60 ¹⁶⁷	41·794 ¹⁰⁴	50·29 ⁸	33·113 ¹⁴¹	32·08 ¹¹⁴
27·6	49·444 ¹¹⁰	78·93 ²⁰²	41·690 ⁶⁴	50·21 [—]	32·972 ⁹⁰	30·94 ¹²⁷
Nov. 6·6	49·334 ⁶²	76·91 ²³⁵	41·626 ¹⁸	50·21 ¹⁰	32·882 ³¹	29·67 ¹³⁵
16·6	49·272 ¹¹	74·56 ²⁶²	41·608 ³⁰	50·31 ²²	32·851 ³³	28·32 ¹³⁷
26·5	49·261 ⁴²	71·94 ²⁸⁴	41·638 ⁸¹	50·53 ³⁴	32·884 ⁹⁹	26·95 ¹³³
Dec. 6·5	49·303 ⁹⁷	69·10 ²⁹⁷	41·719 ¹³¹	50·87 ⁴⁷	32·983 ¹⁶⁴	25·62 ¹²³
16·5	49·400 ¹⁴⁹	66·13 ³⁰¹	41·850 ¹⁷⁷	51·34 ⁶⁰	33·147 ²²⁴	24·39 ¹⁰⁹
26·5	49·549 ¹⁹⁵	63·12 ²⁹⁵	42·027 ²¹⁸	51·94 ⁶⁹	33·371 ²⁷⁸	23·30 ⁹¹
36·4	49·744	60·17	42·245	52·63	33·649	22·39
Mean Place	48·009	75·63	38·856	45·44	29·527	19·04
Secδ, Tanδ	1·167	+ 0·601	1·039	− 0·280	1·371	− 0·938
<i>a</i> , <i>a'</i>	+2·3	− 5·4	+3·4	− 4·6	+4·3	− 4·6
<i>b</i> , <i>b'</i>	−0·01	+ 1·0	0·00	+ 1·0	+0·01	+ 1·0
Authority and Catalogue No.	B.J.	1036	B.J.	1040	A.N.	1041

† Second transit, June 9

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ζ Draconis		α ¹ Herculis		δ Herculis	
Mag. Spect.	3.22	B ₅	Var.	Mb	3.16	A ₂
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 17 ^m 08	+65° 47'	^h 17 ^m 11	+14° 27'	^h 17 ^m 12	+24° 54'
Jan. 1.4	32.70	27.29	40.416	38.64	20.930	42.58
11.4	32.97	23.86	40.628	36.37	21.139	39.89
21.4	33.33	20.73	40.872	34.23	21.383	37.38
31.4	33.77	18.02	41.141	32.30	21.656	35.13
Feb. 10.3	34.27	15.82	41.428	30.65	21.949	33.24
20.3	34.82	14.22	41.726	29.36	22.255	31.79
Mar. 2.3	35.39	13.27	42.030	28.47	22.568	30.81
12.2	35.97	13.00	42.332	28.00	22.881	30.36
22.2	36.54	13.41	42.628	27.99	23.188	30.42
Apr. 1.2	37.09	14.47	42.915	28.40	23.485	31.00
11.2	37.59	16.14	43.187	29.22	23.766	32.06
21.1	38.04	18.34	43.443	30.41	24.027	33.54
May 1.1	38.42	20.98	43.677	31.90	24.265	35.39
11.1	38.72	23.98	43.887	33.64	24.476	37.52
21.1	38.95	27.22	44.069	35.56	24.657	39.86
31.0	39.08	30.59	44.221	37.58	24.803	42.33
June 10.0	39.13†	34.00	44.338†	39.64	24.913†	44.85
19.9	39.08	37.34	44.420	41.68	24.985	47.34
29.9	38.95	40.53	44.464	43.66	25.016	49.74
July 9.9	38.74	43.48	44.470	45.50	25.007	51.98
19.9	38.44	46.13	44.438	47.18	24.958	54.02
29.9	38.08	48.40	44.369	48.65	24.871	55.81
Aug. 8.8	37.65	50.26	44.267	49.89	24.748	57.31
18.8	37.17	51.66	44.135	50.88	24.596	58.48
28.8	36.65	52.57	43.978	51.60	24.418	59.32
Sept. 7.8	36.10	52.97	43.805	52.04	24.224	59.81
17.7	35.54	52.84	43.623	52.19	24.020	59.92
27.7	34.99	52.19	43.441	52.04	23.817	59.65
Oct. 7.7	34.46	51.02	43.269	51.59	23.622	59.01
17.6	33.96	49.35	43.117	50.84	23.449	58.00
27.6	33.52	47.20	42.993	49.79	23.304	56.62
Nov. 6.6	33.14	44.62	42.905	48.46	23.197	54.89
16.6	32.85	41.66	42.860	46.85	23.134	52.85
26.5	32.65	38.38	42.861	45.00	23.119	50.54
Dec. 6.5	32.55	34.89	42.911	42.95	23.156	48.01
16.5	32.55	31.26	43.009	40.75	23.243	45.32
26.5	32.66	27.62	43.154	38.47	23.379	42.57
36.4	32.88	24.08	43.341	36.19	23.561	39.83
Mean Place	35.575	40.51	40.900	47.44	21.571	52.53
Secδ, Tanδ	2.439	+ 2.225	1.033	+ 0.258	1.103	+ 0.465
a, a'	+0.2	- 4.5	+2.7	- 4.2	+2.5	- 4.1
b, b'	-0.03	+ 1.0	0.00	+ 1.0	-0.01	+ 1.0
Authority and Catalogue No.	B.J.	1042	B.J.	1045	B.J.	1046
† Second transit, June 9			† First transit, June 10			

APPARENT PLACES OF STARS, 1935

475

AT UPPER TRANSIT AT GREENWICH

Name	π Herculis		θ Ophiuchi		β Aræ	
	3.36	K ₅	3.37	B ₃	2.80	K ₂
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 17 12	+36° 52'	^h ^m 17 18	-24° 56'	^h ^m 17 19	-55° 28'
Jan. 1.4	45.927 ²¹⁰	41.78 ³⁰⁶	00.537 ²⁴⁹	14.36 ¹⁷	52.589 ³⁶¹	14.93 ¹⁵²
11.4	46.137 ²⁵³	38.72 ²⁸⁴	00.786 ²⁸¹	14.53 ²⁷	52.950 ⁴¹⁵	13.41 ¹²⁸
21.4	46.390 ²⁸⁶	35.88 ²⁵²	01.067 ³⁰⁶	14.80 ³³	53.365 ⁴⁵⁸	12.13 ¹⁰⁰
31.4	46.676 ³¹²	33.36 ²⁰⁸	01.373 ³²⁴	15.13 ³⁸	53.823 ⁴⁸⁹	11.13 ⁷¹
Feb. 10.3	46.988 ³²⁹	31.28 ¹⁵⁹	01.697 ³³⁵	15.51 ³⁹	54.312 ⁵⁰⁹	10.42 ⁴²
20.3	47.317 ³³⁸	29.69 ¹⁰²	02.032 ³³⁹	15.90 ³⁸	54.821 ⁵²⁰	10.00 ¹⁴
Mar. 2.3	47.655 ³⁴⁰	28.67 ⁴⁴	02.371 ³³⁹	16.28 ³⁵	55.341 ⁵²²	09.86 ¹³
12.3	47.995 ³³⁴	28.23 ¹⁷	02.710 ³³³	16.63 ²⁹	55.863 ⁵¹⁶	09.99 ⁴⁰
22.2	48.329 ³²²	28.40 ⁷⁵	03.043 ³²⁵	16.92 ²⁴	56.379 ⁵⁰³	10.39 ⁶⁴
Apr. 1.2	48.651 ³⁰⁴	29.15 ¹²⁹	03.368 ³¹²	17.16 ¹⁹	56.882 ⁴⁸²	11.03 ⁸⁸
11.2	48.955 ²⁸⁰	30.44 ¹⁷⁸	03.680 ²⁹⁶	17.35 ¹⁴	57.364 ⁴⁵⁷	11.91 ¹⁰⁹
21.1	49.235 ²⁵²	32.22 ²¹⁹	03.976 ²⁷⁷	17.49 ¹¹	57.821 ⁴²⁴	13.00 ¹²⁸
May 1.1	49.487 ²¹⁹	34.41 ²⁵¹	04.253 ²⁵⁴	17.60 ⁹	58.245 ³⁸⁴	14.28 ¹⁴⁵
11.1	49.706 ¹⁸²	36.92 ²⁷⁵	04.507 ²²⁶	17.69 ⁸	58.629 ³³⁹	15.73 ¹⁶⁰
21.1	49.888 ¹⁴²	39.67 ²⁸⁹	04.733 ¹⁹⁶	17.77 ⁸	58.968 ²⁸⁶	17.33 ¹⁷¹
31.0	50.030 ¹⁰⁰	42.56 ²⁹⁴	04.929 ¹⁶⁰	17.85 ¹⁰	59.254 ²³⁰	19.04 ¹⁷⁸
June 10.0	50.130 ⁵⁶	45.50 ²⁹²	05.089 ¹²³	17.95 ¹¹	59.484 ¹⁶⁷	20.82 ¹⁸²
19.9	50.186 ¹⁰	48.42 ²⁸⁰	05.212 ⁸²	18.06 ¹¹	59.651 ¹⁰³	22.64 ¹⁸⁰
29.9	50.196 ³⁵	51.22 ²⁶¹	05.294 ³⁰	18.17 ¹⁴	59.754 ³³	24.44 ¹⁷⁴
July 9.9	50.161 ⁷⁹	53.83 ²³⁷	05.333 ³	18.31 ¹⁴	59.787 ³⁴	26.18 ¹⁶²
19.9	50.082 ¹²¹	56.20 ²⁰⁸	05.330 ⁴⁵	18.45 ¹²	59.753 ⁹⁹	27.80 ¹⁴⁵
29.9	49.961 ¹⁵⁹	58.28 ¹⁷³	05.285 ⁸⁴	18.57 ⁸	59.654 ¹⁶¹	29.25 ¹²³
Aug. 8.8	49.802 ¹⁹¹	60.01 ¹³⁵	05.201 ¹¹⁹	18.65 ⁴	59.493 ²¹³	30.48 ⁹⁵
18.8	49.611 ²¹⁸	61.36 ⁹⁴	05.082 ¹⁴⁸	18.69 ³	59.280 ²⁵⁸	31.43 ⁶⁴
28.8	49.393 ²³⁶	62.30 ⁵¹	04.934 ¹⁶⁷	18.66 ¹⁰	59.022 ²⁸⁸	32.07 ²⁹
Sept. 7.8	49.157 ²⁴⁵	62.81 ⁸	04.767 ¹⁷⁹	18.56 ¹⁸	58.734 ³⁰⁴	32.36 ⁹
17.7	48.912 ²⁴⁵	62.89 ³⁸	04.588 ¹⁸⁰	18.38 ²⁷	58.430 ³⁰⁵	32.27 ⁴⁶
27.7	48.667 ²³⁴	62.51 ⁸²	04.408 ¹⁶⁹	18.11 ³³	58.125 ²⁹⁰	31.81 ⁸³
Oct. 7.7	48.433 ²¹²	61.69 ¹²⁶	04.239 ¹⁴⁸	17.78 ³⁹	57.835 ²⁵⁶	30.98 ¹¹⁷
17.7	48.221 ¹⁸²	60.43 ¹⁶⁸	04.091 ¹¹⁷	17.39 ⁴³	57.579 ²⁰⁸	29.81 ¹⁴⁷
27.6	48.039 ¹⁴¹	58.75 ²⁰⁸	03.974 ⁷⁶	16.96 ⁴²	57.371 ¹⁴⁶	28.34 ¹⁷²
Nov. 6.6	47.898 ⁹⁴	56.67 ²⁴⁴	03.898 ²⁹	16.54 ⁴⁰	57.225 ⁷⁴	26.62 ¹⁸⁹
16.6	47.804 ⁴¹	54.23 ²⁷³	03.869 ²²	16.14 ³³	57.151 ⁵	24.73 ²⁰⁰
26.5	47.763 ¹⁶	51.50 ²⁹⁸	03.891 ⁷⁶	15.81 ²⁵	57.156 ⁸⁸	22.73 ²⁰¹
Dec. 6.5	47.779 ⁷²	48.52 ³¹²	03.967 ¹²⁸	15.56 ¹⁵	57.244 ¹⁷⁰	20.72 ¹⁹⁷
16.5	47.851 ¹²⁷	45.40 ³¹⁸	04.095 ¹⁷⁷	15.41 ²	57.414 ²⁴⁷	18.75 ¹⁸⁵
26.5	47.978 ¹⁷⁹	42.22 ³¹⁴	04.272 ²²²	15.39 ⁸	57.661 ³¹⁷	16.90 ¹⁶⁷
36.4	48.157	39.08	04.494	15.47	57.978	15.23
Mean Place	46.851	52.87	00.885	10.56	53.457	14.30
Secδ, Tanδ	1.250	+ 0.750	1.103	- 0.465	1.764	- 1.453
a, a'	+2.1	- 4.1	+3.7	- 3.7	+5.0	- 3.5
b, b'	-0.01	+ 1.0	+0.01	+ 1.0	+0.02	+ 1.0
Authority and Catalogue No.	B.J.	1047	B.J.	1052	B.J.	1055

† First transit, June 10

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	σ Ophiuchi		ν Scorpii		α Arae	
Mag. Spect.	4.44	Ko	2.80	B ₃	2.97	B ₃ p
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₇ ^m ₂₃	+ [°] ₄ ['] ₁₁	^h ₁₇ ^m ₂₆	- [°] ₃₇ ['] ₁₄	^h ₁₇ ^m ₂₆	- [°] ₄₉ ['] ₄₉
Jan. 1.4	16.819 ²⁰⁹	36.61 ¹⁷⁷	20.074 ²⁶⁹	47.10 ⁵⁹	48.099 ³¹⁷	37.18 ¹²⁸
11.4	17.028 ²³⁹	34.84 ¹⁷⁰	20.343 ³⁰⁸	46.51 ⁴⁴	48.416 ³⁶⁶	35.90 ¹⁰⁸
21.4	17.267 ²⁶³	33.14 ¹⁵⁴	20.651 ³³⁸	46.07 ²⁹	48.782 ⁴⁰³	34.82 ⁸⁵
31.4	17.530 ²⁸²	31.60 ¹³⁶	20.989 ³⁶⁰	45.78 ¹⁵	49.185 ⁴³²	33.97 ⁶⁰
Feb. 10.3	17.812 ²⁹³	30.24 ¹⁰⁹	21.349 ³⁷⁴	45.63 ³	49.617 ⁴⁵⁰	33.37 ³⁷
20.3	18.105 ²⁹⁸	29.15 ⁷⁹	21.723 ³⁸¹	45.60 ⁹	50.067 ⁴⁶¹	33.00 ¹⁵
Mar. 2.3	18.403 ³⁰¹	28.36 ⁴⁵	22.104 ³⁸³	45.69 ¹⁸	50.528 ⁴⁶⁴	32.85 ⁸
12.3	18.704 ²⁹⁶	27.91 ¹²	22.487 ³⁷⁸	45.87 ²⁷	50.992 ⁴⁵⁹	32.93 ²⁹
22.2	19.000 ²⁸⁸	27.79 ²⁵	22.865 ³⁷⁰	46.14 ³⁵	51.451 ⁴⁴⁹	33.22 ⁴⁸
Apr. 1.2	19.288 ²⁷⁷	28.04 ⁵⁹	23.235 ³⁵⁸	46.49 ⁴¹	51.900 ⁴³⁴	33.70 ⁶⁸
11.2	19.565 ²⁶³	28.63 ⁸⁷	23.593 ³⁴¹	46.90 ⁴⁸	52.334 ⁴¹¹	34.38 ⁸⁵
21.1	19.828 ²⁴³	29.50 ¹¹¹	23.934 ³¹⁹	47.38 ⁵⁴	52.745 ³⁸⁵	35.23 ¹⁰¹
May 1.1	20.071 ²²³	30.61 ¹³²	24.253 ²⁹³	47.92 ⁶¹	53.130 ³⁵²	36.24 ¹¹⁶
11.1	20.294 ¹⁹⁷	31.93 ¹⁴⁵	24.546 ²⁶³	48.53 ⁶⁷	53.482 ³¹⁴	37.40 ¹²⁸
21.1	20.491 ¹⁶⁹	33.38 ¹⁵⁵	24.809 ²²⁸	49.20 ⁷³	53.796 ²⁷⁰	38.68 ¹³⁹
31.0	20.660 ¹³⁷	34.93 ¹⁵⁹	25.037 ¹⁸⁸	49.93 ⁷⁷	54.066 ²¹⁹	40.07 ¹⁴⁷
June 10.0	20.797 ¹⁰²	36.52 ¹⁵⁶	25.225 ¹⁴⁵	50.70 ⁸¹	54.285 ¹⁶⁶	41.54 ¹⁵⁰
19.9	20.899 ⁶⁴	38.08 ¹⁵²	25.370 ⁹⁸	51.51 ⁸²	54.451 ¹⁰⁸	43.04 ¹⁵¹
29.9	20.963 ²⁷	39.60 ¹⁴¹	25.468 ⁵⁰	52.33 ⁸¹	54.559 ⁴⁷	44.55 ¹⁴⁷
July 9.9	20.990 ¹²	41.01 ¹³⁰	25.518 [—]	53.14 ⁷⁶	54.606 ¹³	46.02 ¹³⁹
19.9	20.978 ⁴⁹	42.31 ¹¹⁴	25.518 ⁴⁸	53.90 ⁶⁹	54.593 ⁷¹	47.41 ¹²⁶
29.9	20.929 ⁸³	43.45 ⁹⁹	25.470 ⁹³	54.59 ⁵⁹	54.522 ¹²⁷	48.67 ¹⁰⁷
Aug. 8.8	20.846 ¹¹⁵	44.44 ⁷⁹	25.377 ¹³⁴	55.18 ⁴⁶	54.395 ¹⁷⁶	49.74 ⁸⁴
18.8	20.731 ¹⁴¹	45.23 ⁶³	25.243 ¹⁶⁶	55.64 ²⁹	54.219 ²¹⁶	50.58 ⁵⁸
28.8	20.590 ¹⁶⁰	45.86 ⁴⁰	25.077 ¹⁹¹	55.93 ¹⁰	54.003 ²⁴⁶	51.16 ²⁰
Sept. 7.8	20.430 ¹⁶⁹	46.26 ²¹	24.886 ²⁰⁶	56.03 ⁹	53.757 ²⁶²	51.45 ⁴
17.7	20.261 ¹⁷²	46.47 [—]	24.680 ²⁰⁸	55.94 ³⁰	53.495 ²⁶⁵	51.41 ³⁶
27.7	20.089 ¹⁶⁵	46.47 ²⁰	24.472 ¹⁹⁸	55.64 ⁵⁰	53.230 ²⁵²	51.05 ⁶⁸
Oct. 7.7	19.924 ¹⁴⁶	46.27 ⁴⁵	24.274 ¹⁷⁶	55.14 ⁶⁹	52.978 ²²⁵	50.37 ⁹⁹
17.7	19.778 ¹¹⁹	45.82 ⁶⁵	24.098 ¹⁴²	54.45 ⁸³	52.753 ¹⁸⁴	49.38 ¹²⁴
27.6	19.659 ⁸⁴	45.17 ⁸⁷	23.956 ⁹⁷	53.62 ⁹⁴	52.569 ¹³¹	48.14 ¹⁴⁷
Nov. 6.6	19.575 ⁴⁴	44.30 ¹⁰⁸	23.859 ⁴⁵	52.68 ¹⁰²	52.438 ⁶⁷	46.67 ¹⁶¹
16.6	19.531 ²	43.22 ¹³⁰	23.814 ¹²	51.66 ¹⁰⁴	52.371 ³	45.06 ¹⁷⁰
26.5	19.533 ⁴⁹	41.92 ¹⁴⁶	23.826 ⁷²	50.62 ¹⁰⁰	52.374 ⁷⁵	43.36 ¹⁷³
Dec. 6.5	19.582 ⁹⁸	40.46 ¹⁶⁰	23.898 ¹³²	49.62 ⁹⁴	52.449 ¹⁴⁸	41.63 ¹⁶⁷
16.5	19.680 ¹⁴⁰	38.86 ¹⁷¹	24.030 ¹⁸⁷	48.68 ⁸³	52.597 ²¹⁶	39.96 ¹⁵⁷
26.5	19.820 ¹⁸³	37.15 ¹⁷⁴	24.217 ²³⁹	47.85 ⁷⁰	52.813 ²⁷⁸	38.39 ¹⁴²
36.4	20.003	35.41	24.456	47.15	53.091	36.97
Mean Place	17.231	43.82	20.531	44.47	48.790	35.74
Sec δ , Tan δ	1.003	+ 0.073	1.256	- 0.760	1.550	- 1.184
a, a'	+3.0	- 3.2	+4.1	- 2.9	+4.6	- 2.9
b, b'	0.00	+ 1.0	+0.01	+ 1.0	+0.01	+ 1.0
Authority and Catalogue No.	A.E.	1060	A.N.	1063	B.J.	1064

APPARENT PLACES OF STARS, 1935

477

AT UPPER TRANSIT AT GREENWICH

Name	β Draconis		λ Scorpii		α Ophiuchi	
	2.99	Go	1.71	B2	2.14	A5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₇ ^m ₂₈	[°] ₊₅₂ ['] ₂₀	^h ₁₇ ^m ₂₉	[°] ₋₃₇ ['] ₀₃	^h ₁₇ ^m ₃₁	[°] ₊₁₂ ['] ₃₆
Jan. 1.4	56.014	45.02	11.051	32.03	54.404	13.93
11.4	56.215	41.62	11.318	31.43	54.599	11.77
21.4	56.476	38.46	11.622	30.97	54.827	09.71
31.4	56.788	35.65	11.957	30.67	55.082	07.84
Feb. 10.3	57.141	33.30	12.314	30.50	55.358	06.23
20.3	57.526	31.49	12.686	30.45	55.647	04.94
Mar. 2.3	57.932	30.29	13.065	30.51	55.944	04.03
12.3	58.346	29.74	13.447	30.67	56.245	03.53
22.2	58.758	29.85	13.825	30.90	56.542	03.46
Apr. 1.2	59.159	30.61	14.195	31.21	56.834	03.81
11.2	59.538	31.98	14.553	31.59	57.115	04.56
21.1	59.887	33.90	14.895	32.03	57.381	05.67
May 1.1	60.200	36.29	15.216	32.54	57.629	07.09
11.1	60.467	39.06	15.511	33.11	57.856	08.75
21.1	60.686	42.12	15.777	33.75	58.056	10.60
31.0	60.850	45.36	16.008	34.46	58.227	12.57
June 10.0	60.956	48.68	16.199	35.21	58.366	14.60
19.9	61.003	52.00	16.347	36.00	58.469	16.61
29.9	60.990	55.21	16.448	36.80	58.532	18.57
July 9.9	60.917	58.24	16.501	37.60	58.558	20.42
19.9	60.787	61.01	16.504	38.36	58.545	22.10
29.9	60.602	63.46	16.459	39.06	58.493	23.60
Aug. 8.8	60.368	65.54	16.368	39.65	58.405	24.89
18.8	60.093	67.20	16.236	40.11	58.285	25.93
28.8	59.782	68.41	16.071	40.42	58.138	26.72
Sept. 7.8	59.447	69.13	15.880	40.54	57.971	27.25
17.7	59.097	69.35	15.674	40.46	57.792	27.49
27.7	58.746	69.07	15.466	40.18	57.610	27.46
Oct. 7.7	58.404	68.28	15.268	39.70	57.435	27.14
17.7	58.084	66.99	15.091	39.04	57.276	26.53
27.6	57.799	65.21	14.948	38.23	57.143	25.64
Nov. 6.6	57.559	62.98	14.848	37.30	57.043	24.47
16.6	57.374	60.34	14.801	36.31	56.984	23.03
26.5	57.253	57.36	14.810	35.28	56.969	21.35
Dec. 6.5	57.200	54.11	14.879	34.28	57.002	19.46
16.5	57.218	50.68	15.007	33.35	57.083	17.42
26.5	57.308	47.17	15.191	32.52	57.209	15.29
36.4	57.467	43.70	15.425	31.82	57.378	13.12
Mean Place	57.691	55.82	11.509	29.31	54.913	21.69
Sec δ , Tan δ	1.637	+ 1.296	1.253	- 0.755	1.025	+ 0.224
a, a'	+1.4	- 2.7	+4.1	- 2.7	+2.8	- 2.4
b, b'	-0.01	+ 1.0	+0.01	+ 1.0	0.00	+ 1.0
Authority and Catalogue No.	B.J.	1067	B.J.	1066	B.J.	1070

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	θ Scorpii		κ Scorpii		η Pavonis	
	2.04	Fo	2.51	B2	3.58	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 17 ^m 32	[°] 42 ['] 57	^h 17 ^m 37	[°] 38 ['] 59	^h 17 ^m 39	[°] 64 ['] 41
Jan. 1.5	38.136 ²⁸¹	32.08 ⁹⁶	58.798 ²⁶¹	56.75 ⁷⁸	19.55	44.04 ²¹²
11.4	38.417 ³²⁴	31.12 ⁷⁹	59.059 ³⁰³	55.97 ⁶³	19.96 ⁴¹	41.92 ¹⁸⁸
21.4	38.741 ³⁵⁷	30.33 ⁶⁰	59.362 ³³⁵	55.34 ⁴⁸	20.45 ⁵⁵	40.04 ¹⁵⁸
31.4	39.098 ³⁸³	29.73 ⁴³	59.697 ³⁵⁹	54.86 ³³	21.00 ⁶⁰	38.46 ¹²⁷
Feb. 10.3	39.481 ⁴⁰⁰	29.30 ²⁶	60.056 ³⁷⁶	54.53 ²⁰	21.60 ⁶⁴	37.19 ⁹³
20.3	39.881 ⁴⁰⁹	29.04 ⁹	60.432 ³⁸⁶	54.33 ⁸	22.24 ⁶⁶	36.26 ⁵⁸
Mar. 2.3	40.290 ⁴¹³	28.95 ⁷	60.818 ³⁹⁰	54.25 ⁴	22.90 ⁶⁸	35.68 ²⁴
12.3	40.703 ⁴¹⁰	29.02 ²⁰	61.208 ³⁸⁸	54.29 ¹⁴	23.58 ⁶⁷	35.44 ¹¹
22.2	41.113 ⁴⁰²	29.22 ³⁴	61.596 ³⁸¹	54.43 ²⁴	24.25 ⁶⁶	35.55 ⁴⁴
Apr. 1.2	41.515 ³⁸⁹	29.56 ⁴⁵	61.977 ³⁷¹	54.67 ³²	24.91 ⁶⁴	35.99 ⁷⁶
11.2	41.904 ³⁷²	30.01 ⁵⁸	62.348 ³⁵⁵	54.99 ⁴¹	25.55 ⁶¹	36.75 ¹⁰⁵
21.2	42.276 ³⁴⁹	30.59 ⁷⁰	62.703 ³³⁵	55.40 ⁵¹	26.16 ⁵⁷	37.80 ¹³⁴
May 1.1	42.625 ³²²	31.29 ⁸¹	63.038 ³⁰⁹	55.91 ⁵⁹	26.73 ⁵²	39.14 ¹⁵⁸
11.1	42.947 ²⁸⁹	32.10 ⁹¹	63.347 ²⁸⁰	56.50 ⁶⁷	27.25 ⁴⁶	40.72 ¹⁸⁰
21.1	43.236 ²⁵¹	33.01 ⁹⁹	63.627 ²⁴⁵	57.17 ⁷⁵	27.71 ³⁹	42.52 ¹⁹⁸
31.0	43.487 ²⁰⁸	34.00 ¹⁰⁷	63.872 ²⁰⁵	57.92 ⁸²	28.10 ³²	44.50 ²¹¹
June 10.0	43.695 ¹⁶²	35.07 ¹¹¹	64.077 ¹⁶¹	58.74 ⁸⁷	28.42 ²⁴	46.61 ²²⁰
19.9	43.857 ¹¹¹	36.18 ¹¹⁴	64.238 ¹¹³	59.61 ⁸⁹	28.66 ¹⁵	48.81 ²²²
29.9	43.968 ⁵⁶	37.32 ¹⁰⁷	64.351 ⁶²	60.50 ⁹⁰	28.81 ⁵	51.03 ²¹⁸
July 9.9	44.024 ³	38.43 ¹⁰⁷	64.413 ¹¹	61.40 ⁸⁷	28.86 ³	53.21 ²⁰⁷
19.9	44.027 ⁵⁰	39.50 ⁹⁷	64.424 ³⁹	62.27 ⁸¹	28.83 ¹²	55.28 ¹⁹¹
29.9	43.977 ¹⁰¹	40.47 ⁸⁵	64.385 ⁸⁶	63.08 ⁷¹	28.71 ²¹	57.19 ¹⁶⁷
Aug. 8.9	43.876 ¹⁴⁵	41.32 ⁶⁷	64.299 ¹³⁰	63.79 ⁵⁷	28.50 ²⁸	58.86 ¹³⁸
18.8	43.731 ¹⁸²	41.99 ⁴⁷	64.169 ¹⁶⁶	64.36 ⁴¹	28.22 ³⁴	60.24 ¹⁰¹
28.8	43.549 ²¹⁰	42.46 ²³	64.003 ¹⁹⁴	64.77 ²¹	27.88 ³⁹	61.25 ⁶²
Sept. 7.8	43.339 ²²⁶	42.69 ²	63.809 ²¹¹	64.98 [—]	27.49 ⁴²	61.87 ¹⁸
17.7	43.113 ²³⁰	42.67 ²⁸	63.598 ²¹⁵	64.98 ²²	27.07 ⁴²	62.05 ²⁷
27.7	42.883 ²²¹	42.39 ⁵⁵	63.383 ²⁰⁷	64.76 ⁴⁴	26.65 ⁴¹	61.78 ⁷²
Oct. 7.7	42.662 ¹⁹⁸	41.84 ⁷⁸	63.176 ¹⁸⁸	64.32 ⁶⁴	26.24 ³⁸	61.06 ¹¹⁵
17.7	42.464 ¹⁶²	41.06 ⁹⁹	62.988 ¹⁵⁵	63.68 ⁸³	25.86 ³²	59.91 ¹⁵⁶
27.6	42.302 ¹¹⁵	40.07 ¹¹⁶	62.833 ¹¹¹	62.85 ⁹⁷	25.54 ²⁵	58.35 ¹⁸⁹
Nov. 6.6	42.187 ⁵²	38.91 ¹²⁷	62.722 ⁶⁰	61.88 ¹⁰⁷	25.29 ¹⁶	56.46 ²¹⁶
16.6	42.128 ¹	37.64 ¹³⁴	62.662 ²	60.81 ¹¹²	25.13 ⁶	54.30 ²³⁶
26.6	42.129 ⁶⁶	36.30 ¹³⁴	62.660 ⁵⁹	59.69 ¹¹¹	25.07 ⁵	51.94 ²⁴⁵
Dec. 6.5	42.195 ¹³¹	34.96 ¹²⁹	62.719 ¹¹⁹	58.58 ¹⁰⁸	25.12 ¹⁵	49.49 ²⁴⁸
16.5	42.326 ¹⁹¹	33.67 ¹²¹	62.838 ¹⁷⁶	57.50 ⁹⁸	25.27 ²⁶	47.01 ²⁴⁰
26.5	42.517 ²⁴⁶	32.46 ¹⁰⁶	63.014 ²²⁹	56.52 ⁸⁷	25.53 ³⁵	44.61 ²²⁶
36.4	42.763	31.40	63.243	55.65	25.88	42.35
Mean Place	38.682	29.81	59.287	53.93	20.947	43.10
Sec δ , Tan δ	1.366	-0.931	1.287	-0.810	2.340	-2.115
α , α'	+4.3	-2.4	+4.2	-1.9	+5.9	-1.8
δ , δ'	+0.01	+1.0	0.00	+1.0	+0.01	+1.0
Authority and Catalogue No.	B.J.	1071	A.N.	1075	B.J.	1079

APPARENT PLACES OF STARS, 1935

479

AT UPPER TRANSIT AT GREENWICH

Name	β Ophiuchi		γ Scorpii		μ Herculis	
	2.94	Ko	3.14	F5p	3.48	G5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 17 40	+ [°] ['] 4 35	^h ^m 17 43	- [°] ['] 40 06	^h ^m 17 43	+ [°] ['] 27 45
Jan. 1.5	15.129 ¹⁹²	28.26 ¹⁷³	01.645 ²⁶⁰	15.80 ⁸⁷	53.964 ¹⁷⁶	19.30 ²⁸⁰
11.4	15.321 ²²⁶	26.53 ¹⁶⁶	01.905 ³⁰¹	14.93 ⁷³	54.140 ²¹⁵	16.50 ²⁶⁴
21.4	15.547 ²⁵¹	24.87 ¹⁵⁴	02.206 ³³⁵	14.20 ⁵⁸	54.355 ²⁴⁸	13.86 ²⁴¹
31.4	15.798 ²⁷¹	23.33 ¹³³	02.541 ³⁶⁰	13.62 ⁴³	54.603 ²⁷⁵	11.45 ²⁰⁶
Feb. 10.4	16.069 ²⁸⁶	22.00 ¹⁰⁹	02.901 ³⁷⁹	13.19 ²⁹	54.878 ²⁹⁴	09.39 ¹⁶⁵
20.3	16.355 ²⁹⁴	20.91 ⁷⁷	03.280 ³⁹⁰	12.90 ¹⁶	55.172 ³⁰⁷	07.74 ¹¹⁶
Mar. 2.3	16.649 ²⁹⁸	20.14 ⁴⁴	03.670 ³⁹⁴	12.74 ⁴	55.479 ³¹⁴	06.58 ⁶⁴
12.3	16.947 ²⁹⁷	19.70 ⁹	04.064 ³⁹⁴	12.70 ⁹	55.793 ³¹⁴	05.94 ¹⁰
22.2	17.244 ²⁹¹	19.61 ²⁷	04.458 ³⁸⁹	12.79 ¹⁹	56.107 ³⁰⁹	05.84 ⁴⁵
Apr. 1.2	17.535 ²⁸³	19.88 ⁶¹	04.847 ³⁷⁸	12.98 ²⁹	56.416 ²⁹⁹	06.29 ⁹⁶
11.2	17.818 ²⁷¹	20.49 ⁹⁰	05.225 ³⁶³	13.27 ³⁹	56.715 ²⁸³	07.25 ¹⁴²
21.2	18.089 ²⁵⁵	21.39 ¹¹⁶	05.588 ³⁴³	13.66 ⁴⁹	56.998 ²⁶³	08.67 ¹⁸³
May 1.1	18.344 ²³⁴	22.55 ¹³⁷	05.931 ³¹⁸	14.15 ⁵⁹	57.261 ²³⁹	10.50 ²¹⁷
11.1	18.578 ²¹¹	23.92 ¹⁵²	06.249 ²⁸⁹	14.74 ⁶⁹	57.500 ²⁰⁹	12.67 ²⁴¹
21.1	18.789 ¹⁸³	25.44 ¹⁶²	06.538 ²⁵³	15.43 ⁷⁸	57.709 ¹⁷⁶	15.08 ²⁵⁹
31.1	18.972 ¹⁵²	27.06 ¹⁶⁵	06.791 ²¹⁴	16.21 ⁸⁵	57.885 ¹⁴⁰	17.67 ²⁶⁷
June 10.0	19.124 ¹¹⁷	28.71 ¹⁶⁵	07.005 ¹⁶⁸	17.06 ⁹¹	58.025 ¹⁰⁰	20.34 ²⁶⁹
19.9	19.241 ⁷⁹	30.36 ¹⁶⁰	07.173 ¹¹⁹	17.97 ⁹⁵	58.125 ⁵⁸	23.03 ²⁶⁴
29.9	19.320 ⁴¹	31.96 ¹⁵⁰	07.292 ⁶⁹	18.92 ⁹⁶	58.183 ¹⁴	25.67 ²⁴⁹
July 9.9	19.361 ¹	33.46 ¹³⁷	07.361 ¹⁶	19.88 ⁹³	58.197 ²⁸	28.16 ²³⁰
19.9	19.362 ³⁷	34.83 ¹²³	07.377 ³⁵	20.81 ⁸⁷	58.169 ⁷¹	30.46 ²⁰⁷
29.9	19.325 ⁷⁴	36.06 ¹⁰⁶	07.342 ⁸⁵	21.68 ⁷⁷	58.098 ¹¹⁰	32.53 ¹⁷⁸
Aug. 8.9	19.251 ¹⁰⁷	37.12 ⁸⁶	07.257 ¹²⁸	22.45 ⁶⁴	57.988 ¹⁴⁴	34.31 ¹⁴⁶
18.8	19.144 ¹³⁶	37.98 ⁶⁸	07.129 ¹⁶⁷	23.09 ⁴⁷	57.844 ¹⁷⁵	35.77 ¹¹²
28.8	19.008 ¹⁵⁶	38.66 ⁴⁷	06.962 ¹⁹⁶	23.56 ²⁶	57.669 ¹⁹⁷	36.89 ⁷⁴
Sept. 7.8	18.852 ¹⁷⁰	39.13 ²⁷	06.766 ²¹³	23.82 ⁵	57.472 ²¹¹	37.63 ³⁶
17.8	18.682 ¹⁷⁴	39.40 ⁵	06.553 ²²⁰	23.87 ¹⁸	57.261 ²¹⁶	37.99 ³
27.7	18.508 ¹⁶⁹	39.45 ¹⁵	06.333 ²¹³	23.69 ⁴³	57.045 ²¹¹	37.96 ⁴³
Oct. 7.7	18.339 ¹⁵³	39.30 ³⁹	06.120 ¹⁹⁴	23.26 ⁶³	56.834 ¹⁹⁷	37.53 ⁸³
17.7	18.186 ¹²⁹	38.91 ⁶¹	05.926 ¹⁶¹	22.63 ⁸²	56.637 ¹⁷¹	36.70 ¹²³
27.6	18.057 ⁹⁷	38.30 ⁸³	05.765 ¹¹⁸	21.81 ⁹⁹	56.466 ¹³⁸	35.47 ¹⁶⁰
Nov. 6.6	17.960 ⁵⁷	37.47 ¹⁰⁴	05.647 ⁶⁷	20.82 ¹¹¹	56.328 ⁹⁸	33.87 ¹⁹⁴
16.6	17.903 ¹³	36.43 ¹²⁵	05.580 ²	19.71 ¹¹⁷	56.230 ⁵¹	31.93 ²²⁶
26.6	17.800 ³³	35.18 ¹⁴³	05.571 ⁵²	18.54 ¹¹⁸	56.179 ¹	29.67 ²⁵⁰
Dec. 6.5	17.923 ⁸⁰	33.75 ¹⁵⁷	05.623 ¹¹⁴	17.36 ¹¹⁵	56.178 ⁴⁹	27.17 ²⁷¹
16.5	18.003 ¹²⁵	32.18 ¹⁶⁸	05.737 ¹⁷²	16.21 ¹⁰⁸	56.227 ¹⁰⁰	24.46 ²⁸⁰
26.5	18.128 ¹⁶⁶	30.50 ¹⁷¹	05.909 ²²⁶	15.13 ⁹⁶	56.327 ¹⁴⁷	21.66 ²⁸²
36.5	18.294	28.79	06.135	14.17	56.474	18.84
Mean Place	15.574	35.00	02.154	12.92	54.747	27.58
Secd. Tanδ	1.003	+ 0.080	1.307	- 0.842	1.130	+ 0.526
a, a'	+3.0	- 1.7	+4.2	- 1.5	+2.4	- 1.4
b, b'	0.00	+ 1.0	0.00	+ 1.0	0.00	+ 1.0
Authority and Catalogue No.	B.J.	1080	A.N.	1081	B.J.	1084

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	G Scorpii		89 Herculis		γ Draconis	
Mag. Spect.	3·25	K2	5·48	F5p	2·42	K5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 17 45	[°] ['] -37 01	^h ^m 17 52	[°] ['] +26 03	^h ^m 17 55	[°] ['] +51 12
Jan. 1·5	25·529	30·96	46·939	25·65	03·939	36·76
11·4	25·778 ²⁴⁹	30·25 ⁷¹	47·108 ¹⁶⁹	22·95 ²⁷⁰	04·101 ¹⁶²	33·35 ²²¹
21·4	26·066 ²⁸⁸	29·67 ⁵⁸	47·316 ²⁰⁸	20·38 ²⁵⁷	04·322 ²⁷⁷	30·12 ³²²
31·4	26·386 ³²⁰	29·22 ⁴⁵	47·556 ²⁴⁰	18·03 ²³⁵	04·599 ³²²	27·18 ³⁵⁸
Feb. 10·4	26·732 ³⁴⁶	28·88 ³⁴	47·824 ²⁶⁸	16·00 ²⁰³	04·921 ³⁵⁸	24·65
	363 ²²		288	161		
20·3	27·095	28·66	48·112	14·39	05·270	22·63
Mar. 2·3	27·469 ³⁷⁴	28·55 ¹¹	48·413 ³⁰¹	13·22 ¹¹⁷	05·665 ³⁸⁶	21·18
12·3	27·848 ³⁷⁹	28·52 ³	48·722 ³⁰⁹	12·57 ⁶⁵	06·066 ⁴⁰¹	20·36
22·2	28·227 ³⁷⁹	28·57 ⁵	49·034 ³¹²	12·46 ¹¹	06·472 ⁴⁰⁶	20·20
Apr. 1·2	28·601 ³⁷⁴	28·70 ¹³	49·340 ³⁰⁶	12·86 ⁴⁰	06·875 ⁴⁰³	20·70
	365 ²¹		301	92	389	
11·2	28·966	28·91	49·641	13·78	07·264	21·82
21·2	29·316 ³⁵⁰	29·19 ²⁸	49·926 ²⁸⁵	15·16 ¹³⁸	07·629 ³⁶⁵	23·51
May 1·1	29·648 ³³²	29·55 ³⁶	50·196 ²⁷⁰	16·05 ¹⁷⁹	07·965 ³³⁶	25·71
11·1	29·957 ³⁰⁹	29·98 ⁴³	50·440 ²⁴⁴	19·05 ²¹⁰	08·261 ²⁹⁶	28·34
21·1	30·238 ²⁸¹	30·50 ⁵²	50·659 ²¹⁹	21·43 ²³⁸	08·512 ²⁵¹	31·30
	247 ⁶⁰		185	255	201	
31·1	30·485	31·10	50·844	23·98	08·713	34·49
June 10·0	30·694 ²⁰⁹	31·77 ⁶⁷	50·993 ¹⁴⁹	26·62 ²⁶⁴	08·858 ¹⁴⁵	37·81
20·0	30·860 ¹⁶⁶	32·50 ⁷³	51·105 ¹¹²	29·28 ²⁶⁶	08·946 ⁸⁸	41·18
29·9	30·980 ¹²⁰	33·26 ⁷⁶	51·174 ⁶⁹	31·92 ²⁶⁴	08·974 ²⁸	44·50
July 9·9	31·051 ⁷¹	34·04 ⁷⁸	51·200 ²⁶	34·40 ²⁴⁸	08·941 ³³	47·68
	20		15	232	93	
19·9	31·071	34·82	51·185	36·72	08·848	50·65
29·9	31·041 ³⁰	35·55 ⁷³	51·126 ⁵⁹	38·81 ²⁰⁹	08·699 ¹⁴⁹	53·34
Aug. 8·9	30·964 ⁷⁷	36·20 ⁶⁵	51·028 ⁹⁸	40·63 ¹⁸²	08·497 ²⁰²	55·68
18·8	30·844 ¹²⁰	36·75 ⁵⁵	50·891 ¹³⁷	42·13 ¹⁵⁰	08·249 ²⁴⁸	57·64
28·8	30·687 ¹⁵⁷	37·15 ⁴⁰	50·726 ¹⁶⁵	43·31 ¹¹⁸	07·962 ²⁸⁷	59·17
	185 ²³		188	83	318	
Sept. 7·8	30·502	37·38	50·538	44·14	07·644	60·24
17·8	30·299 ²⁰³	37·42 ⁴	50·334 ²⁰⁴	44·58 ⁴⁴	07·307 ³³⁷	60·82
27·7	30·090 ²⁰⁹	37·26 ¹⁶	50·123 ²¹¹	44·66 ⁸	06·962 ³⁴⁵	60·89
Oct. 7·7	29·886 ²⁰⁴	36·89 ³⁷	49·916 ²⁰⁷	44·34 ³²	06·619 ³⁴³	60·45
17·7	29·701 ¹⁸⁵	36·34 ⁵⁵	49·721 ¹⁹⁵	43·63 ⁷¹	06·293 ³²⁶	59·51
	154 ⁷²		169	109	297	
27·6	29·547	35·62	49·552	42·54	05·996	58·06
Nov. 6·6	29·433 ¹¹⁴	34·76 ⁸⁶	49·413 ¹³⁹	41·08 ¹⁴⁶	05·737 ²⁵⁹	56·14
16·6	29·368 ⁶⁵	33·81 ⁹⁵	49·311 ¹⁰²	39·28 ¹⁸⁰	05·529 ²⁰⁸	53·78
26·6	29·359 ²	32·81 ¹⁰⁰	49·257 ⁵⁴	37·16 ²¹²	05·378 ¹⁵¹	51·04
Dec. 6·5	29·409 ⁵⁰	31·80 ¹⁰¹	49·251 ⁶	34·78 ²³⁸	05·292 ⁸⁶	47·98
	108 ⁹⁷		43	258	19	
16·5	29·517	30·83	49·294	32·20	05·273	44·68
26·5	29·682 ¹⁶⁵	29·94 ⁸⁹	49·387 ⁹³	29·51 ²⁶⁹	05·325 ⁵²	41·25
36·5	29·898 ²¹⁶	29·14 ⁸⁰	49·527 ¹⁴⁰	26·79 ²⁷²	05·443 ¹¹⁸	37·81
Mean Place	25·999	27·76	47·706	33·27	05·667	45·12
Sec δ , Tan δ	1·253	-0·754	1·113	+0·489	1·606	+1·257
a , a'	+4·1	-1·3	+2·4	-0·6	+1·4	-0·4
b , b'	0·00	+1·0	0·00	+1·0	0·00	+1·0
Authority and Catalogue No.	A.N.	1086	A.E.	1091	B.J.	1095

† Second transit, June 19

† First transit, June 20

APPARENT PLACES OF STARS, 1935

481

AT UPPER TRANSIT AT GREENWICH

Name	ν Ophiuchi		γ Sagittarii		72 Ophiuchi	
	3.50	Ko	3.07	Ko	3.73	A3
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 17 ^m 55	— [°] 9 ['] 46	^h 18 ^m 01	— [°] 30 ['] 25	^h 18 ^m 04	+ [°] 9 ['] 32
Jan. 1.5	26.420 ¹⁹²	07.12 88	37.464 ²¹⁶	39.74 40	15.476 ¹⁶⁶	65.66 ¹⁹²
11.4	26.612 ²²⁵	08.00 88	37.680 ²⁵⁴	39.34 32	15.642 ²⁰¹	63.74 ¹⁸⁶
21.4	26.837 ²⁵²	08.88 83	37.934 ²⁸⁵	39.02 25	15.843 ²³¹	61.88 ¹⁷¹
31.4	27.089 ²⁷⁴	09.71 75	38.219 ³¹⁰	38.77 19	16.074 ²⁵⁴	60.17 ¹⁴⁹
Feb. 10.4	27.363 ²⁸⁹	10.46 61	38.529 ³²⁹	38.58 15	16.328 ²⁷²	58.68 ¹²¹
20.3	27.652 ³⁰⁰	11.07 44	38.858 ³⁴¹	38.43 11	16.600 ²⁸⁵	57.47 ⁸⁷
Mar. 2.3	27.952 ³⁰⁴	11.51 25	39.199 ³⁴⁹	38.32 10	16.885 ²⁹³	56.60 ⁵⁰
12.3	28.256 ³⁰⁶	11.76 4	39.548 ³⁵¹	38.22 9	17.178 ²⁹⁶	56.10 ¹⁰
22.3	28.562 ³⁰⁴	11.80 17	39.899 ³⁴⁹	38.13 8	17.474 ²⁹⁵	56.00 ³⁰
Apr. 1.2	28.866 ²⁹⁸	11.63 37	40.248 ³⁴⁴	38.05 6	17.769 ²⁹⁰	56.30 ⁶⁸
11.2	29.164 ²⁸⁸	11.26 55	40.592 ³³³	37.99 5	18.059 ²⁸¹	56.98 ¹⁰³
21.2	29.452 ²⁷⁴	10.71 69	40.925 ³²⁰	37.94 1	18.340 ²⁶⁷	58.01 ¹³³
May 1.1	29.726 ²⁵⁷	10.02 81	41.245 ³⁰⁰	37.93 2	18.607 ²⁴⁹	59.34 ¹⁵⁹
11.1	29.983 ²³⁵	09.21 88	41.545 ²⁷⁶	37.95 9	18.856 ²²⁷	60.93 ¹⁷⁷
21.1	30.218 ²⁰⁸	08.33 93	41.821 ²⁴⁶	38.04 15	19.083 ²⁰¹	62.70 ¹⁹⁰
31.1	30.426 ¹⁷⁸	07.40 92	42.067 ²¹³	38.19 22	19.284 ¹⁶⁹	64.60 ¹⁹⁶
June 10.0	30.604 ¹⁴³	06.48 90	42.280 ¹⁷³	38.41 28	19.453 ¹³⁵	66.56 ¹⁹⁸
20.0	30.747 ¹⁰⁷	05.58 85	42.453 ¹³⁰	38.69 36	19.588 ⁹⁷	68.54 ¹⁹³
29.9	30.854 ⁶⁶	04.73 77	42.583 ⁸⁴	39.05 40	19.685 ⁵⁷	70.47 ¹⁸³
July 9.9	30.920 ²⁴	03.96 69	42.667 ³⁷	39.45 43	19.742 ¹⁷	72.30 ¹⁶⁹
19.9	30.944 ¹⁶	03.27 60	42.704 ¹¹	39.88 44	19.759 ²⁴	73.99 ¹⁵³
29.9	30.928 ⁵⁶	02.67 50	42.693 ⁵⁷	40.32 42	19.735 ⁶³	75.52 ¹³³
Aug. 8.9	30.872 ⁹²	02.17 42	42.636 ⁹⁹	40.74 38	19.672 ⁹⁹	76.85 ¹¹¹
18.8	30.780 ¹²⁴	01.75 33	42.537 ¹³⁵	41.12 30	19.573 ¹³¹	77.96 ⁸⁸
28.8	30.656 ¹⁴⁷	01.42 24	42.402 ¹⁶⁵	41.42 21	19.442 ¹⁵⁴	78.84 ⁶⁴
Sept. 7.8	30.509 ¹⁶⁴	01.18 16	42.237 ¹⁸⁴	41.63 8	19.288 ¹⁷¹	79.48 ³⁹
17.8	30.345 ¹⁷⁰	01.02 9	42.053 ¹⁹³	41.71 5	19.117 ¹⁷⁹	79.87 ¹³
27.7	30.175 ¹⁶⁷	00.93 2	41.860 ¹⁹¹	41.66 18	18.938 ¹⁷⁸	80.00 ¹³
Oct. 7.7	30.008 ¹⁵⁴	00.91 7	41.669 ¹⁷⁷	41.48 32	18.760 ¹⁶⁶	79.87 ³⁹
17.7	29.854 ¹³¹	00.98 16	41.492 ¹⁵¹	41.16 43	18.594 ¹⁴⁶	79.48 ⁶⁵
27.7	29.723 ¹⁰⁰	01.14 26	41.341 ¹¹⁵	40.73 52	18.448 ¹¹⁶	78.83 ⁹²
Nov. 6.6	29.623 ⁶⁰	01.40 37	41.226 ⁷²	40.21 59	18.332 ⁸⁰	77.91 ¹¹⁶
16.6	29.563 ¹⁶	01.77 47	41.154 ²²	39.62 62	18.252 ³⁸	76.75 ¹³⁹
26.6	29.547 ³¹	02.24 60	41.132 ³¹	39.00 62	18.214 ⁶	75.36 ¹⁵⁹
Dec. 6.5	29.578 ⁷⁷	02.84 69	41.163 ⁸⁵	38.38 58	18.220 ⁵²	73.77 ¹⁷⁶
16.5	29.655 ¹²³	03.53 78	41.248 ¹³⁶	37.80 53	18.272 ⁹⁷	72.01 ¹⁸⁶
26.5	29.778 ¹⁶⁵	04.31 85	41.384 ¹⁸⁵	37.27 46	18.369 ¹⁴⁰	70.15 ¹⁹²
36.5	29.943	05.16	41.569	36.81	18.509	68.23
Mean Place	26.803	01.80	37.882	35.73	16.000	71.87
Sec δ, Tan δ	1.015	— 0.172	1.160	— 0.587	1.014	+ 0.168
a, a'	+3.3	— 0.4	+3.9	+ 0.1	+2.8	+ 0.4
b, b'	0.00	+ 1.0	0.00	+ 1.0	0.00	+ 1.0
Authority and Catalogue No.	B.J.	1096	B.J.	1103	B.J.	1105

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	μ Sagittarii		η Sagittarii		δ Sagittarii	
	4.01	B8p	3.16	Mb	2.84	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	18 09	-21 04	18 13	-36 46	18 16	-29 51
Jan. 1.5	52.121 ¹⁹²	43.62 ¹³	13.213 ²¹⁵	62.59 ⁸⁵	49.512 ¹⁹⁸	30.99 ⁴⁵
11.5	52.313 ²²⁸	43.75 ¹⁶	13.428 ²⁵⁷	61.74 ⁷⁷	49.710 ²³⁷	30.54 ³⁹
21.4	52.541 ²⁵⁷	43.91 ¹⁸	13.685 ²⁹³	60.97 ⁶⁷	49.947 ²⁷⁰	30.15 ³³
31.4	52.798 ²⁸²	44.09 ¹⁷	13.978 ³²²	60.30 ⁵⁷	50.217 ²⁹⁷	29.82 ³⁰
Feb. 10.4	53.080 ²⁹⁹	44.26 ¹²	14.300 ³⁴³	59.73 ⁴⁹	50.514 ³¹⁷	29.52 ²⁶
20.3	53.379 ³¹³	44.38 ⁶	14.643 ³⁶⁰	59.24 ⁴⁰	50.831 ³³²	29.26 ²⁴
Mar. 2.3	53.692 ³²⁰	44.44 ¹	15.003 ³⁶⁹	58.84 ³²	51.163 ³⁴²	29.02 ²³
12.3	54.012 ³²⁴	44.43 ¹⁰	15.372 ³⁷⁵	58.52 ²⁴	51.505 ³⁴⁸	28.79 ²³
22.3	54.336 ³²⁴	44.33 ²⁰	15.747 ³⁷⁵	58.28 ¹⁷	51.853 ³⁴⁸	28.56 ²³
Apr. 1.2	54.660 ³²⁰	44.13 ²⁸	16.122 ³⁷¹	58.11 ⁹	52.201 ³⁴⁵	28.33 ²²
11.2	54.980 ³¹²	43.85 ³⁵	16.493 ³⁶¹	58.02 ¹	52.546 ³³⁷	28.11 ²⁰
21.2	55.292 ³⁰⁰	43.50 ⁴⁰	16.854 ³⁴⁸	58.01 ⁹	52.883 ³²⁵	27.91 ¹⁷
May 1.2	55.592 ²⁸³	43.10 ⁴²	17.202 ³²⁸	58.10 ¹⁹	53.208 ³⁰⁹	27.74 ¹²
11.1	55.875 ²⁶²	42.68 ⁴²	17.530 ³⁰⁴	58.29 ²⁹	53.517 ²⁸⁶	27.62 ⁶
21.1	56.137 ²³⁶	42.26 ⁴⁰	17.834 ²⁷³	58.58 ⁴⁰	53.803 ²⁵⁹	27.56 ²
31.1	56.373 ²⁰⁵	41.86 ³⁶	18.107 ²³⁷	58.98 ⁵⁰	54.062 ²²⁶	27.58 ¹⁰
June 10.0	56.578 ¹⁶⁸	41.50 ³⁰	18.344 ¹⁹⁶	59.48 ⁶⁰	54.288 ¹⁸⁷	27.68 ¹⁹
20.0	56.746 ¹³⁰	41.20 ²³	18.540 ¹⁴⁹	60.08 ⁶⁹	54.475 ¹⁴⁵	27.87 ²⁶
29.9	56.876 ⁸⁶	40.97 ¹⁶	18.689 ¹⁰¹	60.77 ⁷⁴	54.620 ¹⁰⁰	28.13 ³³
July 9.9	56.962 ⁴³	40.81 ¹⁰	18.790 ⁵⁰	61.51 ⁷⁷	54.720 ⁵²	28.46 ³⁹
19.9	57.005 ²	40.71 ⁴	18.840 ³	62.28 ⁷⁸	54.772 ⁴	28.85 ⁴¹
29.9	57.003 ⁴⁶	40.67 [—]	18.837 ⁵³	63.06 ⁷³	54.776 ⁴²	29.26 ⁴²
Aug. 8.9	56.957 ⁸⁵	40.67 ³	18.784 ⁹⁹	63.79 ⁶⁷	54.734 ⁸⁷	29.68 ⁴⁰
18.9	56.872 ¹²¹	40.70 ³	18.685 ¹⁴¹	64.46 ⁵⁶	54.647 ¹²⁶	30.08 ³⁴
28.8	56.751 ¹⁴⁸	40.73 ³	18.544 ¹⁷³	65.02 ⁴¹	54.521 ¹⁵⁶	30.42 ²⁶
Sept. 7.8	56.603 ¹⁶⁸	40.76 ¹	18.371 ¹⁹⁶	65.43 ²⁴	54.365 ¹⁷⁹	30.68 ¹⁶
17.8	56.435 ¹⁷⁷	40.75 ⁴	18.175 ²⁰⁹	65.67 ⁴	54.186 ¹⁹¹	30.84 ⁴
27.7	56.258 ¹⁷⁷	40.71 ⁷	17.966 ²¹⁰	65.71 ³⁵	53.995 ¹⁹¹	30.88 ⁹
Oct. 7.7	56.081 ¹⁶⁵	40.64 ¹¹	17.756 ¹⁹⁷	65.56 ¹⁵	53.804 ¹⁸⁰	30.79 ²³
17.7	55.916 ¹⁴³	40.53 ¹⁵	17.559 ¹⁷¹	65.21 ⁵⁴	53.624 ¹⁵⁸	30.56 ³⁴
27.7	55.773 ¹¹²	40.38 ¹⁵	17.388 ¹³⁵	64.67 ⁷⁰	53.466 ¹²⁶	30.22 ⁴⁵
Nov. 6.6	55.661 ⁷²	40.23 ¹⁵	17.253 ⁹¹	63.97 ⁸⁴	53.340 ⁸⁴	29.77 ⁵²
16.6	55.589 ²⁶	40.08 ¹³	17.162 ⁴⁰	63.13 ⁹²	53.256 ³⁶	29.25 ⁵⁷
26.6	55.563 ²¹	39.95 ⁹	17.122 ¹⁷	62.21 ⁹⁸	53.220 ¹⁵	28.68 ⁵⁹
Dec. 6.6	55.584 ⁷¹	39.86 ³	17.139 ⁷⁴	61.23 ⁹⁹	53.235 ⁶⁷	28.09 ⁵⁸
16.5	55.655 ¹¹⁹	39.83 ³	17.213 ¹³⁰	60.24 ⁹⁶	53.302 ¹¹⁹	27.51 ⁵⁴
26.5	55.774 ¹⁶³	39.86 ⁹	17.343 ¹⁸¹	59.28 ⁹¹	53.421 ¹⁶⁷	26.97 ⁵⁰
36.5	55.937	39.95	17.524	58.37	53.588	26.47
Mean Place	52.503	39.00	13.687	58.63	49.927	26.66
Sec δ , Tan δ	1.072	-0.385	1.249	-0.748	1.153	-0.574
a, a'	+3.6	+0.9	+4.1	+1.2	+3.8	+1.5
b, b'	0.00	+1.0	0.00	+1.0	0.00	+1.0
Authority and Catalogue No.	B.J.	1109	A.N.	1111	A.N.	1114

APPARENT PLACES OF STARS, 1935

483

AT UPPER TRANSIT AT GREENWICH

Name	η Serpentis		ε Sagittarii		α Telescopii	
Mag. Spect.	3.42	Ko	1.95	Ao	3.76	B ₃
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 18 ^m 17	— 2 54	^h 18 ^m 19	— 34 25	^h 18 ^m 22	— 46 00
Jan. 1.5	56.281 ₁₆₂	66.92 ₁₂₁	51.006 ₂₀₂	05.90 ₇₄	08.672 ₂₂₇	25.86 ₁₄₄
11.5	56.443 ₁₉₇	68.13 ₁₁₉	51.208 ₂₄₅	05.16 ₆₆	08.899 ₂₇₈	24.42 ₁₃₄
21.4	56.640 ₂₂₇	69.32 ₁₁₀	51.453 ₂₇₉	04.50 ₆₀	09.177 ₃₂₀	23.08 ₁₂₁
Feb. 31.4	56.867 ₂₅₀	70.42 ₉₈	51.732 ₃₀₈	03.90 ₅₂	09.497 ₃₅₅	21.87 ₁₀₇
10.4	57.117 ₂₆₈	71.40 ₇₈	52.040 ₃₃₀	03.38 ₄₆	09.852 ₃₈₃	20.80 ₉₂
20.3	57.385 ₂₈₃	72.18 ₅₆	52.370 ₃₄₆	02.92 ₄₀	10.235 ₄₀₃	19.88 ₇₅
Mar. 2.3	57.668 ₂₉₁	72.74 ₃₀	52.716 ₃₅₇	02.52 ₃₅	10.638 ₄₁₈	19.13 ₆₀
12.3	57.959 ₂₉₆	73.04 ₂	53.073 ₃₆₄	02.17 ₃₀	11.056 ₄₂₅	18.53 ₄₃
22.3	58.255 ₂₉₈	73.06 ₂₆	53.437 ₃₆₅	01.87 ₂₅	11.481 ₄₂₅	18.10 ₂₅
Apr. 1.2	58.553 ₂₉₅	72.80 ₅₃	53.802 ₃₆₂	01.62 ₁₉	11.906 ₄₂₆	17.85 ₉
11.2	58.848 ₂₈₉	72.27 ₇₇	54.164 ₃₅₄	01.43 ₁₃	12.332 ₄₁₆	17.76 ₈
21.2	59.137 ₂₇₈	71.50 ₉₈	54.518 ₃₄₃	01.30 ₅	12.748 ₄₀₀	17.84 ₂₇
May 1.2	59.415 ₂₆₃	70.52 ₁₁₄	54.861 ₃₂₅	01.25 ₃	13.148 ₃₈₀	18.11 ₄₄
11.1	59.678 ₂₄₃	69.38 ₁₂₆	55.186 ₃₀₂	01.28 ₁₃	13.528 ₃₅₁	18.55 ₆₁
21.1	59.921 ₂₁₈	68.12 ₁₃₄	55.488 ₂₇₃	01.41 ₂₃	13.879 ₃₁₇	19.16 ₇₈
31.1	60.139 ₁₉₀	66.78 ₁₃₅	55.761 ₂₃₈	01.64 ₃₄	14.196 ₂₇₅	19.94 ₉₄
June 10.0	60.329 ₁₅₆	65.43 ₁₃₅	55.999 ₁₉₉	01.98 ₄₃	14.471 ₂₂₉	20.88 ₁₀₇
20.0	60.485 ₁₁₉	64.08 ₁₃₀	56.198 ₁₅₄	02.41 ₅₂	14.700 ₁₇₇	21.95 ₁₁₇
29.9	60.604 ₇₉	62.78 ₁₂₀	56.352 ₁₀₆	02.93 ₆₀	14.877 ₁₁₉	23.12 ₁₂₄
July 9.9	60.683 ₃₉	61.58 ₁₀₉	56.458 ₅₆	03.53 ₆₄	14.996 ₆₀	24.36 ₁₂₇
19.9	60.722 ₄	60.49 ₉₆	56.514 ₅	04.17 ₆₆	15.056 _—	25.63 ₁₂₄
29.9	60.718 ₄₄	59.53 ₈₃	56.519 ₄₅	04.83 ₆₅	15.056 ₅₉	26.87 ₁₁₉
Aug. 8.9	60.674 ₈₁	58.70 ₆₈	56.474 ₉₀	05.48 ₆₀	14.997 ₁₁₂	28.06 ₁₀₆
18.9	60.593 ₁₁₄	58.02 ₅₄	56.384 ₁₃₁	06.08 ₅₁	14.885 ₁₆₂	29.12 ₉₀
28.8	60.479 ₁₄₂	57.48 ₃₈	56.253 ₁₆₅	06.59 ₃₉	14.723 ₂₀₀	30.02 ₆₈
Sept. 7.8	60.337 ₁₆₀	57.10 ₂₄	56.088 ₁₈₉	06.98 ₂₅	14.523 ₂₂₉	30.70 ₄₄
17.8	60.177 ₁₇₀	56.86 ₁₀	55.899 ₂₀₂	07.23 ₈	14.294 ₂₄₅	31.14 ₁₆
27.7	60.007 ₁₇₁	56.76 ₅	55.697 ₂₀₂	07.31 ₉	14.049 ₂₄₇	31.30 ₁₃
Oct. 7.7	59.836 ₁₆₂	56.81 ₂₀	55.495 ₁₉₂	07.22 ₂₈	13.802 ₂₃₅	31.17 ₄₂
17.7	59.674 ₁₄₂	57.01 ₃₄	55.303 ₁₆₉	06.94 ₄₄	13.567 ₂₀₈	30.75 ₇₁
27.7	59.532 ₁₁₅	57.35 ₅₀	55.134 ₁₃₆	06.50 ₅₉	13.359 ₁₇₀	30.04 ₉₆
Nov. 6.6	59.417 ₈₀	57.85 ₆₄	54.998 ₉₁	05.91 ₇₀	13.189 ₁₂₁	29.08 ₁₁₈
16.6	59.337 ₃₉	58.49 ₈₀	54.907 ₄₃	05.21 ₈₀	13.068 ₆₃	27.90 ₁₃₅
26.6	59.298 ₅	59.29 ₉₃	54.864 ₁₁	04.41 ₈₃	13.005 _—	26.55 ₁₄₇
Dec. 6.6	59.303 ₅₀	60.22 ₁₀₆	54.875 ₆₆	03.58 ₈₅	13.005 ₆₄	25.08 ₁₅₂
16.5	59.353 ₉₄	61.28 ₁₁₄	54.941 ₁₁₉	02.73 ₈₄	13.069 ₁₂₈	23.56 ₁₅₄
26.5	59.447 ₁₃₆	62.42 ₁₁₉	55.060 ₁₇₀	01.89 ₇₈	13.197 ₁₈₈	22.02 ₁₄₉
36.5	59.583	63.61	55.230	01.11	13.385	20.53
Mean Place	56.708	61.63	51.455	01.70	09.282	22.00
Secδ, Tanδ	1.001	— 0.051	1.212	— 0.685	1.440	— 1.036
a, a'	+3.1	+ 1.6	+4.0	+ 1.7	+4.5	+ 1.9
b, b'	0.00	+ 1.0	0.00	+ 1.0	— 0.01	+ 1.0
Authority and Catalogue No.	B.J.	1116	B.J.	1118	B.J.	1120

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	χ Draconis		λ Sagittarii		α Lyrae (<i>Vega</i>)	
Mag. Spect.	3.69	F8	2.94	Ko	0.14	Ao
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 18 ^m 22	+72° 41'	^h 18 ^m 23	-25° 27'	^h 18 ^m 34	+38° 42'
Jan. 1.5	08.73	72.97	57.124	37.77	42.998	74.95
11.5	08.83	69.45	57.307	37.57	43.112	71.88
21.4	09.07	66.04	57.528	37.40	43.275	68.89
31.4	09.44	62.87	57.781	37.26	43.482	66.10
Feb. 10.4	09.93	60.06	58.061	37.13	43.729	63.62
20.4	10.52	57.71	58.362	36.99	44.007	61.54
Mar. 2.3	11.20	55.92	58.678	36.82	44.313	59.95
12.3	11.93	54.75	59.004	36.61	44.637	58.91
22.3	12.69	54.24	59.336	36.36	44.974	58.46
Apr. 1.2	13.46	54.40	59.671	36.07	45.316	58.62
11.2	14.22	55.21	60.004	35.74	45.657	59.36
21.2	14.93	56.65	60.331	35.39	45.990	60.66
May 1.2	15.58	58.64	60.647	35.04	46.307	62.47
11.1	16.15	61.12	60.948	34.70	46.603	64.72
21.1	16.62	63.99	61.228	34.40	46.870	67.32
31.1	16.98	67.16	61.483	34.15	47.102	70.19
June 10.1	17.23	70.53	61.707	33.97	47.296	73.25
20.0	17.35	74.02	61.895	33.87	47.445	76.41
29.9	17.35	77.50	62.042	33.85	47.545	79.58
July 9.9	17.22	80.91	62.145	33.92	47.597	82.68
19.9	16.96	84.17	62.203	34.05	47.598	85.64
29.9	16.59	87.18	62.213	34.24	47.549	88.38
Aug. 8.9	16.11	89.90	62.178	34.46	47.451	90.86
18.9	15.54	92.25	62.100	34.70	47.308	93.02
28.8	14.89	94.20	61.985	34.93	47.126	94.82
Sept. 7.8	14.17	95.69	61.838	35.11	46.912	96.22
17.8	13.40	96.69	61.669	35.24	46.674	97.20
27.8	12.60	97.18	61.487	35.29	46.422	97.73
Oct. 7.7	11.80	97.15	61.302	35.26	46.165	97.79
17.7	11.02	96.58	61.127	35.14	45.915	97.39
27.7	10.27	95.47	60.973	34.94	45.682	96.53
Nov. 6.6	09.58	93.86	60.849	34.68	45.475	95.21
16.6	08.97	91.75	60.764	34.37	45.305	93.46
26.6	08.45	89.20	60.723	34.03	45.178	91.31
Dec. 6.6	08.06	86.28	60.731	33.70	45.099	88.81
16.5	07.79	83.05	60.789	33.38	45.072	86.04
26.5	07.66	79.62	60.896	33.10	45.099	83.08
36.5	07.67	76.11	61.049	32.86	45.180	80.02
Mean Place	13.737	78.50	57.518	33.19	44.181	79.69
Sec 8, Tan 8	3.364	+ 3.212	1.108	- 0.476	1.282	+ 0.802
a, a'	-1.2	+ 1.9	+3.7	+ 2.1	+2.0	+ 3.0
b, b'	+0.02	+ 1.0	0.00	+ 1.0	+0.01	+ 1.0
Authority and Catalogue No.	B.J.	1123	A.N.	1125	B.J.	1134

§ Transit, June 30

APPARENT PLACES OF STARS, 1935

485

AT UPPER TRANSIT AT GREENWICH

Name Mag. Spect.	ζ Pavonis		4 H Scuti		φ Sagittarii	
	4.10	Ko	4.74	Fo	3.30	B8
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	18 ^h 35 ^m	-71° 29'	18 ^h 38 ^m	-9° 06'	18 ^h 41 ^m	-27° 03'
Jan. 1.5	25.03 ³⁶	16.96 ²⁷⁹	42.440 ¹⁴⁹	63.04 ⁷⁴	35.342 ¹⁶⁷	37.98 ³⁸
11.5	25.39 ⁴⁸	14.17 ²⁶⁵	42.589 ¹⁸⁷	63.78 ⁷⁴	35.509 ²⁰⁵	37.60 ³⁶
21.4	25.87 ⁵⁸	11.52 ²⁴⁵	42.776 ²¹⁵	64.52 ⁶⁸	35.714 ²⁴⁰	37.24 ³⁵
31.4	26.45 ⁶⁶	09.07 ²¹⁹	42.991 ²⁴²	65.20 ⁶⁰	35.954 ²⁶⁹	36.89 ³⁴
Feb. 10.4	27.11 ⁷⁴	06.88 ¹⁸⁸	43.233 ²⁶²	65.80 ⁴⁴	36.223 ²⁹²	36.55 ³⁴
20.4	27.85 ⁸⁰	05.00 ¹⁵⁵	43.495 ²⁷⁸	66.24 ²⁸	36.515 ³¹⁰	36.21 ³⁶
Mar. 2.3	28.65 ⁸⁴	03.45 ¹¹⁸	43.773 ²⁹¹	66.52 ⁶	36.825 ³²³	35.85 ⁴⁰
12.3	29.49 ⁸⁷	02.27 ⁸¹	44.064 ²⁹⁹	66.58 ¹⁴	37.148 ³³²	35.45 ⁴²
22.3	30.36 ⁸⁸	01.46 ⁴³	44.363 ³⁰⁴	66.44 ³⁵	37.480 ³³⁸	35.03 ⁴⁴
Apr. 1.3	31.24 ⁸⁷	01.03 ³	44.667 ³⁰³	66.09 ⁵⁷	37.818 ³³⁹	34.59 ⁴⁷
11.2	32.11 ⁸⁵	01.00 ³⁴	44.970 ³⁰¹	65.52 ⁷⁵	38.157 ³³⁶	34.12 ⁴⁸
21.2	32.96 ⁸²	01.34 ⁷³	45.271 ²⁹³	64.77 ⁹⁰	38.493 ³²⁸	33.64 ⁴⁵
May 1.2	33.78 ⁷⁷	02.07 ¹⁰⁸	45.564 ²⁸²	63.87 ¹⁰²	38.821 ³¹⁵	33.19 ⁴²
11.1	34.55 ⁷¹	03.15 ¹⁴¹	45.846 ²⁶⁴	62.85 ¹¹⁰	39.136 ²⁹⁶	32.77 ³⁶
21.1	35.26 ⁶³	04.56 ¹⁷²	46.110 ²⁴²	61.75 ¹¹³	39.432 ²⁷²	32.41 ²⁹
31.1	35.89 ⁵⁴	06.28 ¹⁹⁷	46.352 ²¹³	60.62 ¹¹²	39.704 ²⁴²	32.12 ²⁰
June 10.1	36.43 ⁴⁴	08.25 ²¹⁹	46.565 ¹⁸²	59.50 ¹⁰⁹	39.946 ²⁰⁷	31.92 ⁹
20.0	36.87 ³²	10.44 ²³³	46.747 ¹⁴⁴	58.41 ¹⁰⁴	40.153 ¹⁶⁷	31.83 ¹
30.0	37.19 ²⁰	12.77 ²⁴³	46.891 ¹⁰⁵	57.37 ⁹⁴	40.320 ¹²³	31.84 ¹¹
July 9.9	37.39 ⁸	15.20 ²⁴⁴	46.996 ⁶¹	56.43 ⁸³	40.443 ⁷⁵	31.95 ¹⁹
19.9	37.47 ⁵	17.64 ²³⁸	47.057 ²⁰	55.60 ⁷⁰	40.518 ²⁷	32.14 ²⁷
29.9	37.42 ¹⁸	20.02 ²²³	47.077 ²⁴	54.90 ⁶⁰	40.545 ²⁰	32.41 ³²
Aug. 8.9	37.24 ²⁹	22.25 ²⁰¹	47.053 ⁶⁵	54.30 ⁴⁷	40.525 ⁶⁶	32.73 ³⁴
18.9	36.95 ³⁹	24.26 ¹⁷¹	46.988 ¹⁰¹	53.83 ³⁵	40.459 ¹⁰⁶	33.07 ³³
28.8	36.56 ⁴⁸	25.97 ¹³⁴	46.887 ¹²⁹	53.48 ²⁵	40.353 ¹³⁹	33.40 ³⁰
Sept. 7.8	36.08 ⁵⁴	27.31 ⁹¹	46.758 ¹⁵³	53.23 ¹⁵	40.214 ¹⁶⁵	33.70 ²³
17.8	35.54 ⁵⁹	28.22 ⁴³	46.605 ¹⁶⁷	53.08 ⁶	40.049 ¹⁸²	33.93 ¹⁵
27.8	34.95 ⁶⁰	28.65 ⁷	46.438 ¹⁶⁹	53.02 ²	39.867 ¹⁸⁷	34.08 ⁵
Oct. 7.7	34.35 ⁵⁸	28.58 ⁵⁸	46.269 ¹⁶⁵	53.04 ¹⁰	39.680 ¹⁸¹	34.13 ⁶
17.7	33.77 ⁵⁴	28.00 ¹⁰⁹	46.104 ¹⁴⁸	53.14 ¹⁹	39.499 ¹⁶⁴	34.07 ¹⁶
27.7	33.23 ⁴⁶	26.91 ¹⁵⁵	45.956 ¹²³	53.33 ²⁸	39.335 ¹³⁶	33.91 ²⁵
Nov. 6.7	32.77 ³⁸	25.36 ¹⁹⁷	45.833 ⁸⁹	53.61 ³⁶	39.199 ⁹⁹	33.66 ³³
16.6	32.39 ²⁶	23.39 ²³¹	45.744 ⁵¹	53.97 ⁴⁴	39.100 ⁵⁷	33.33 ³⁹
26.6	32.13 ¹³	21.08 ²⁵⁹	45.693 ⁸	54.41 ⁵⁵	39.043 ⁴⁰	32.94 ⁴¹
Dec. 6.6	32.00 ¹³	18.49 ²⁷⁵	45.685 ³⁷	54.96 ⁶³	39.034 ⁴⁰	32.53 ⁴³
16.5	32.00 ¹³	15.74 ²⁸⁵	45.722 ⁸⁰	55.59 ⁶⁹	39.074 ⁸⁹	32.10 ⁴³
26.5	32.13 ²⁷	12.89 ²⁸⁴	45.802 ¹²¹	56.28 ⁷³	39.163 ¹³⁴	31.67 ⁴¹
36.5	32.40	10.05	45.923	57.01	39.297	31.26 ⁴¹
Mean Place	27.110	13.20	42.840	58.23	35.734	33.24
Sec δ, Tan δ	3.149	-2.986	1.013	-0.160	1.123	-0.511
a, a'	+7.0	+3.1	+3.3	+3.4	+3.7	+3.6
b, b'	-0.03	+1.0	0.00	+1.0	-0.01	+1.0
Authority and Catalogue No.	B.J.	1133	A.E.	1136	A.N.	1138

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	λ Pavonis		30 Sagittarii		β Lyræ	
Mag. Spect.	4.42	B2	6.24	Fo	Var.	B8p—B2p
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	$18^{\text{h}} 46^{\text{m}}$	$-62^{\circ} 15'$	$18^{\text{h}} 46^{\text{m}}$	$-22^{\circ} 14'$	$18^{\text{h}} 47^{\text{m}}$	$+33^{\circ} 16'$
Jan. 1.5	10.84	56.63	55.618	22.21	39.690	66.29
11.5	11.08	54.21	55.772	22.11	39.794	63.42
21.4	11.41	51.87	55.965	22.02	39.943	60.61
31.4	11.81	49.69	56.191	21.92	40.133	57.97
Feb. 10.4	12.27	47.70	56.445	21.80	40.360	55.59
20.4	12.78	45.94	56.722	21.63	40.617	53.59
Mar. 2.3	13.34	44.45	57.017	21.40	40.901	52.03
12.3	13.92	43.24	57.325	21.09	41.204	50.99
22.3	14.52	42.33	57.644	20.70	41.521	50.50
Apr. 1.3	15.13	41.73	57.969	20.23	41.846	50.59
11.2	15.74	41.45	58.295	19.69	42.172	51.23
21.2	16.35	41.49	58.620	19.10	42.494	52.41
May 1.2	16.93	41.86	58.938	18.47	42.804	54.08
11.1	17.49	42.54	59.244	17.85	43.097	56.17
21.1	18.01	43.52	59.533	17.26	43.366	58.62
31.1	18.49	44.78	59.799	16.71	43.606	61.33
June 10.1	18.90	46.29	60.037	16.22	43.810	64.23
20.0	19.24	48.01	60.241	15.83	43.975	67.24
30.0	19.51	49.90	60.406	15.53	44.094	70.28
July 9.9	19.70	51.91	60.529	15.34	44.168	73.25
19.9	19.80	53.96	60.607	15.25	44.194	76.09
29.9	19.81	56.00	60.638	15.25	44.171	78.74
Aug. 8.9	19.73	57.95	60.624	15.33	44.101	81.15
18.9	19.57	59.74	60.564	15.46	43.988	83.27
28.8	19.33	61.31	60.466	15.62	43.835	85.05
Sept. 7.8	19.03	62.57	60.334	15.78	43.649	86.47
17.8	18.69	63.48	60.177	15.94	43.439	87.49
27.8	18.31	64.00	60.003	16.06	43.213	88.10
Oct. 7.7	17.92	64.08	59.823	16.12	42.980	88.27
17.7	17.53	63.71	59.649	16.15	42.752	88.01
27.7	17.18	62.91	59.489	16.10	42.538	87.31
Nov. 6.7	16.87	61.69	59.356	16.01	42.347	86.17
16.6	16.62	60.09	59.257	15.88	42.189	84.63
26.6	16.45	58.18	59.199	15.73	42.070	82.70
Dec. 6.6	16.37	56.01	59.185	15.57	41.995	80.44
16.5	16.37	53.67	59.219	15.42	41.969	77.90
26.5	16.47	51.24	59.300	15.29	41.992	75.16
36.5	16.66	48.79	59.425	15.18	42.064	72.31
Mean Place	12.001	52.12	55.996	17.43	40.701	70.10
Sec δ , Tan δ	2.149	-1.902	1.080	-0.409	1.196	+0.657
a, a'	+5.6	+4.0	+3.6	+4.1	+2.2	+4.1
b, b'	-0.03	+1.0	-0.01	+1.0	+0.01	+1.0
Authority and Catalogue No.	B.J.	1145	N.A.	1146	B.J.	1147

APPARENT PLACES OF STARS, 1935

487

AT UPPER TRANSIT AT GREENWICH

Name	σ Sagittarii		ξ Sagittarii		γ Lyrae	
Mag. Spect.	2.14	B ₃	3.61	Ko	3.30	Aop
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 18 ^m 51	-26° 22'	^h 18 ^m 53	-21° 11'	^h 18 ^m 56	+32° 35'
Jan. 1.5	13.741	49.37	50.755	42.04	29.631	54.35
11.5	13.896	49.00	50.902	41.98	29.725	51.53
21.5	14.091	48.63	51.086	41.92	29.865	48.76
31.4	14.320	48.28	51.303	41.84	30.045	46.13
Feb. 10.4	14.578	47.91	51.549	41.73	30.263	43.76
20.4	14.861	47.53	51.819	41.56	30.512	41.74
Mar. 2.3	15.162	47.12	52.107	41.32	30.788	40.16
12.3	15.479	46.67	52.410	40.99	31.085	39.09
22.3	15.806	46.18	52.724	40.57	31.398	38.55
Apr. 1.3	16.141	45.65	53.045	40.06	31.719	38.58
11.2	16.478	45.08	53.370	39.47	32.044	39.17
21.2	16.814	44.52	53.693	38.81	32.366	40.29
May 1.2	17.143	43.97	54.011	38.12	32.679	41.91
11.2	17.462	43.45	54.318	37.41	32.977	43.95
21.1	17.763	42.99	54.609	36.72	33.252	46.35
31.1	18.041	42.61	54.878	36.08	33.499	49.03
June 10.1	18.290	42.32	55.120	35.51	33.711	51.90
20.0	18.505	42.14	55.329	35.02	33.886	54.89
30.0	18.680	42.08	55.500	34.64	34.016	57.90
July 9.9	18.811	42.12	55.628	34.37	34.100	60.88
19.9	18.896	42.27	55.712	34.20	34.137	63.74
29.9	18.932	42.50	55.750	34.13	34.125	66.42
Aug. 8.9	18.920	42.79	55.741	34.15	34.065	68.87
18.9	18.863	43.12	55.688	34.24	33.961	71.03
28.9	18.764	43.46	55.596	34.37	33.817	72.86
Sept. 7.8	18.630	43.77	55.469	34.52	33.640	74.34
17.8	18.468	44.03	55.316	34.67	33.436	75.43
27.8	18.290	44.22	55.145	34.80	33.215	76.11
Oct. 7.7	18.104	44.31	54.967	34.89	32.985	76.37
17.7	17.923	44.31	54.793	34.94	32.759	76.19
27.7	17.757	44.21	54.633	34.94	32.546	75.58
Nov. 6.7	17.617	44.02	54.498	34.90	32.354	74.54
16.6	17.512	43.75	54.396	34.83	32.194	73.08
26.6	17.448	43.42	54.333	34.74	32.070	71.24
Dec. 6.6	17.430	43.04	54.314	34.64	31.990	69.07
16.6	17.461	42.65	54.341	34.54	31.957	66.60
26.5	17.539	42.26	54.413	34.45	31.972	63.93
36.5	17.664	41.87	54.530	34.39	32.035	61.14
Mean Place	14.125	44.53	51.127	37.23	30.622	57.49
Sec δ , Tan δ	1.116	-0.496	1.073	-0.388	1.187	+0.640
a, a'	+3.7	+4.4	+3.6	+4.7	+2.2	+4.9
b, b'	-0.01	+1.0	-0.01	+1.0	+0.01	+1.0
Authority and Catalogue No.	B.J.	1150	A.N.	1155	B.J.	1157

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ε Aquilæ		ζ Sagittarii m.		ζ Aquilæ	
	4.21	Ko	2.71	A2	3.02	Ao
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	18 ^h 56 ^m	+14° 58'	18 ^h 58 ^m	-29° 58'	19 ^h 02 ^m	+13° 45'
Jan. 1.5	39.639 ¹¹¹	39.77 ²⁰⁵	28.216 ¹⁵¹	34.08 ⁶³	24.687 ¹⁰⁶	52.58 ¹⁹⁸
11.5	39.750 ¹⁴⁹	37.72 ²⁰¹	28.367 ¹⁹²	33.45 ⁶²	24.793 ¹⁴⁴	50.60 ¹⁹⁵
21.5	39.899 ¹⁸²	35.71 ¹⁸⁹	28.559 ²²⁹	32.83 ⁶¹	24.937 ¹⁷⁸	48.65 ¹⁸³
31.4	40.081 ²¹³	33.82 ¹⁶⁸	28.788 ²⁶⁰	32.22 ⁶¹	25.115 ²⁰⁷	46.82 ¹⁶³
Feb. 10.4	40.294 ²³⁸	32.14 ¹⁴¹	29.048 ²⁸⁵	31.61 ⁶⁰	25.322 ²³⁴	45.19 ¹³⁷
20.4	40.532 ²⁵⁸	30.73 ¹⁰⁷	29.333 ³⁰⁷	31.01 ⁶⁰	25.556 ²⁵⁴	43.82 ¹⁰³
Mar. 2.3	40.790 ²⁷⁵	29.66 ⁶⁷	29.640 ³²³	30.41 ⁶¹	25.810 ²⁷²	42.79 ⁶⁴
12.3	41.065 ²⁸⁸	28.99 ²⁴	29.963 ³³⁵	29.80 ⁶²	26.082 ²⁸⁶	42.15 ²⁴
22.3	41.353 ²⁹⁶	28.75 ¹⁹	30.298 ³⁴⁴	29.18 ⁶²	26.368 ²⁹⁴	41.91 ²⁰
Apr. 1.3	41.649 ²⁹⁹	28.94 ⁶³	30.642 ³⁴⁸	28.56 ⁶⁰	26.662 ²⁹⁹	42.11 ⁶³
11.2	41.948 ²⁹⁷	29.57 ¹⁰⁴	30.990 ³⁴⁷	27.96 ⁵⁷	26.961 ²⁹⁸	42.74 ¹⁰²
21.2	42.245 ²⁹¹	30.61 ¹⁴⁰	31.337 ³⁴²	27.39 ⁵³	27.259 ²⁹³	43.76 ¹³⁹
May 1.2	42.536 ²⁸⁰	32.01 ¹⁷²	31.679 ³³¹	26.86 ⁴⁷	27.552 ²⁸²	45.15 ¹⁶⁸
11.2	42.816 ²⁶²	33.73 ¹⁹⁷	32.010 ³¹⁴	26.39 ³⁷	27.834 ²⁶⁷	46.83 ¹⁹⁴
21.1	43.078 ²⁴⁰	35.70 ²¹⁶	32.324 ²⁹²	26.02 ²⁶	28.101 ²⁴⁴	48.77 ²¹³
31.1	43.318 ²¹²	37.86 ²²⁹	32.616 ²⁶³	25.76 ¹⁵	28.345 ²¹⁷	50.90 ²²⁴
June 10.1	43.530 ¹⁷⁹	40.15 ²³⁴	32.879 ²²⁷	25.61 ²	28.562 ¹⁸⁵	53.14 ²²⁹
20.0	43.709 ¹⁴²	42.49 ²³³	33.106 ¹⁸⁷	25.59 ¹¹	28.747 ¹⁴⁸	55.43 ²²⁹
30.0	43.851 ¹⁰¹	44.82 ²²⁶	33.293 ¹⁴³	25.70 ²³	28.895 ¹⁰⁷	57.72 ²²²
July 9.9	43.952 ⁵⁸	47.08 ²¹⁴	33.436 ⁹⁴	25.93 ³³	29.002 ⁶⁵	59.94 ²¹⁰
19.9	44.010 ¹⁴	49.22 ¹⁹⁸	33.530 ⁴⁴	26.26 ⁴²	29.067 ²¹	62.04 ¹⁹⁴
29.9	44.024 ²⁸	51.20 ¹⁷⁷	33.574 ⁶	26.68 ⁴⁹	29.088 ²²	63.98 ¹⁷⁵
Aug. 8.9	43.996 ⁶⁹	52.97 ¹⁵⁴	33.568 ⁵³	27.17 ⁵⁰	29.066 ⁶⁴	65.73 ¹⁵¹
18.9	43.927 ¹⁰⁶	54.51 ¹²⁹	33.515 ⁹⁷	27.67 ⁵⁰	29.002 ¹⁰¹	67.24 ¹²⁷
28.9	43.821 ¹³⁸	55.80 ¹⁰²	33.418 ¹³⁴	28.17 ⁴⁶	28.901 ¹³²	68.51 ¹⁰¹
Sept. 7.8	43.683 ¹⁶²	56.82 ⁷²	33.284 ¹⁶⁴	28.63 ³⁸	28.769 ¹⁵⁸	69.52 ⁷³
17.8	43.521 ¹⁷⁸	57.54 ⁴³	33.120 ¹⁸³	29.01 ²⁸	28.611 ¹⁷⁴	70.25 ⁴³
27.8	43.343 ¹⁸⁵	57.97 ¹³	32.937 ¹⁹²	29.29 ¹⁵	28.437 ¹⁸²	70.68 ¹⁵
Oct. 7.7	43.158 ¹⁸¹	58.10 ¹⁹	32.745 ¹⁸⁹	29.44 ²	28.255 ¹⁸⁰	70.83 ¹⁵
17.7	42.977 ¹⁶⁹	57.91 ⁴⁹	32.556 ¹⁷⁵	29.46 ¹²	28.075 ¹⁶⁹	70.68 ⁴⁵
27.7	42.808 ¹⁴⁸	57.42 ⁸⁰	32.381 ¹⁴⁹	29.34 ²⁶	27.906 ¹⁴⁸	70.23 ⁷⁴
Nov. 6.7	42.660 ¹²⁰	56.62 ¹⁰⁸	32.232 ¹¹⁵	29.08 ³⁸	27.758 ¹¹⁹	69.49 ¹⁰²
16.6	42.540 ⁸⁴	55.54 ¹³⁵	32.117 ⁷³	28.70 ⁴⁸	27.639 ⁸⁶	68.47 ¹²⁹
26.6	42.456 ⁴⁴	54.19 ¹⁶⁰	32.044 ²⁷	28.22 ⁵⁵	27.553 ⁴⁷	67.18 ¹⁵²
Dec. 6.6	42.412 ²	52.59 ¹⁸⁰	32.017 ²²	27.67 ⁶⁰	27.506 ⁵	65.66 ¹⁷³
16.6	42.410 ⁴¹	50.79 ¹⁹⁵	32.039 ⁷²	27.07 ⁶³	27.501 ³⁸	63.93 ¹⁸⁶
26.5	42.451 ⁸⁴	48.84 ²⁰³	32.111 ¹²⁰	26.44 ⁶⁴	27.539 ⁷⁹	62.07 ¹⁹⁶
36.5	42.535	46.81	32.231	25.80	27.618	60.11
Mean Place	40.255	43.57	28.608	29.09	25.283	56.11
Secδ, Tanδ	1.035	+ 0.268	1.154	- 0.577	1.030	+ 0.245
a, a'	+2.7	+ 4.9	+3.8	+ 5.1	+2.8	+ 5.4
b, b'	0.00	+ 1.0	-0.01	+ 1.0	0.00	+ 1.0
Authority and Catalogue No.	A.N.	1158	A.N.	1159	B.J.	1160

APPARENT PLACES OF STARS, 1935

489

AT UPPER TRANSIT AT GREENWICH

Name	λ Aquilæ		τ Sagittarii		α Coronæ Australis	
	3.55	B9	3.42	Ko	4.12	A2
Mag. Spect.						
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₉ ^m ₀₂	[°] ₄ ['] ₅₈	^h ₁₉ ^m ₀₂	[°] ₂₇ ['] ₄₅	^h ₁₉ ^m ₀₅	[°] ₃₈ ['] ₀₀
Jan. 1.5	47.519 ¹²²	57.49 ⁹²	52.582 ¹⁴³	66.46 ⁵⁰	02.682 ¹⁵⁴	32.09 ¹¹⁴
11.5	47.641 ¹⁵⁸	58.41 ⁹⁰	52.725 ¹⁸⁴	65.96 ⁵⁰	02.836 ²⁰⁰	30.95 ¹¹⁴
21.5	47.799 ¹⁸⁹	59.31 ⁸³	52.909 ²²⁰	65.46 ⁵⁰	03.036 ²⁴⁰	29.81 ¹¹⁰
31.4	47.988 ²¹⁸	60.14 ⁷¹	53.129 ²⁵⁰	64.96 ⁵¹	03.276 ²⁷⁵	28.71 ¹⁰⁶
Feb. 10.4	48.206 ²⁴⁰	60.85 ⁵⁴	53.379 ²⁷⁶	64.45 ⁵²	03.551 ³⁰⁵	27.65 ¹⁰²
20.4	48.446 ²⁶⁰	61.39 ³⁴	53.655 ²⁹⁷	63.93 ⁵⁵	03.856 ³²⁹	26.63 ⁹⁵
Mar. 2.4	48.706 ²⁷⁶	61.73 ¹⁰	53.952 ³¹⁴	63.38 ⁵⁸	04.185 ³⁴⁹	25.68 ⁸⁹
12.3	48.982 ²⁸⁸	61.83 ¹⁵	54.266 ³²⁶	62.80 ⁶¹	04.534 ³⁶⁴	24.79 ⁸³
22.3	49.270 ²⁹⁶	61.68 ⁴¹	54.592 ³³⁶	62.19 ⁶³	04.898 ³⁷³	23.96 ⁷⁴
Apr. 1.3	49.566 ³⁰¹	61.27 ⁶⁵	54.928 ³⁴¹	61.56 ⁶⁴	05.271 ³⁷⁹	23.22 ⁶⁵
11.2	49.867 ³⁰¹	60.62 ⁸⁹	55.269 ³⁴¹	60.92 ⁶³	05.650 ³⁸⁰	22.57 ⁵⁴
21.2	50.168 ²⁹⁷	59.73 ¹⁰⁸	55.610 ³³⁶	60.29 ⁶¹	06.030 ³⁷⁵	22.03 ⁴¹
May 1.2	50.465 ²⁸⁸	58.65 ¹²³	55.946 ³²⁶	59.68 ⁵⁶	06.405 ³⁶⁴	21.62 ²⁸
11.2	50.753 ²⁷⁴	57.42 ¹³⁴	56.272 ³¹¹	59.12 ⁴⁹	06.769 ³⁴⁶	21.34 ¹¹
21.1	51.027 ²⁵⁴	56.08 ¹⁴¹	56.583 ²⁸⁹	58.63 ³⁹	07.115 ³²²	21.23 ⁵
31.1	51.281 ²²⁸	54.67 ¹⁴²	56.872 ²⁶¹	58.24 ²⁸	07.437 ²⁹⁰	21.28 ²²
June 10.1	51.509 ¹⁹⁸	53.25 ¹⁴⁰	57.133 ²²⁸	57.96 ¹⁶	07.727 ²⁵³	21.50 ³⁸
20.1	51.707 ¹⁶²	51.85 ¹³⁴	57.361 ¹⁸⁸	57.80 ³	07.980 ²¹⁰	21.88 ⁵⁴
30.0	51.869 ¹²³	50.51 ¹²⁴	57.549 ¹⁴⁴	57.77 ⁹	08.190 ¹⁶⁰	22.42 ⁶⁸
July 9.9	51.992 ⁸¹	49.27 ¹¹²	57.693 ⁹⁷	57.86 ²¹	08.350 ¹⁰⁷	23.10 ⁷⁹
19.9	52.073 ³⁷	48.15 ⁹⁸	57.790 ⁴⁸	58.07 ³⁰	08.457 ⁵²	23.89 ⁸⁷
29.9	52.110 ⁷	47.17 ⁸⁴	57.838 ¹	58.37 ³⁷	08.509 ²	24.76 ⁹⁰
Aug. 8.9	52.103 ⁴⁷	46.33 ⁶⁹	57.837 ⁴⁹	58.74 ⁴²	08.507 ⁵⁶	25.66 ⁹¹
18.9	52.056 ⁸⁶	45.64 ⁵³	57.788 ⁹¹	59.16 ⁴³	08.451 ¹⁰⁴	26.57 ⁸⁵
28.9	51.970 ¹¹⁸	45.11 ³⁹	57.697 ¹²⁹	59.59 ⁴¹	08.347 ¹⁴⁶	27.42 ⁷⁵
Sept. 7.8	51.852 ¹⁴⁴	44.72 ²⁵	57.568 ¹⁵⁸	60.00 ³⁵	08.201 ¹⁷⁹	28.17 ⁶²
17.8	51.708 ¹⁶⁰	44.47 ¹¹	57.410 ¹⁷⁸	60.35 ²⁸	08.022 ²⁰²	28.79 ⁴⁴
27.8	51.548 ¹⁶⁸	44.36 ¹	57.232 ¹⁸⁷	60.63 ¹⁸	07.820 ²¹³	29.23 ²³
Oct. 7.8	51.380 ¹⁶⁷	44.37 ¹⁴	57.045 ¹⁸⁵	60.81 ⁶	07.607 ²¹¹	29.46 ²
17.7	51.213 ¹⁵³	44.51 ²⁵	56.860 ¹⁷¹	60.87 ⁶	07.396 ¹⁹⁷	29.48 ²¹
27.7	51.060 ¹³³	44.76 ³⁷	56.689 ¹⁴⁸	60.81 ¹⁷	07.199 ¹⁷⁰	29.27 ⁴²
Nov. 6.7	50.927 ¹⁰⁵	45.13 ⁴⁹	56.541 ¹¹⁵	60.64 ²⁸	07.029 ¹³⁵	28.85 ⁶³
16.6	50.822 ⁶⁸	45.62 ⁶¹	56.426 ⁷⁵	60.36 ³⁶	06.894 ⁹¹	28.22 ⁸⁰
26.6	50.754 ³⁰	46.23 ⁷¹	56.351 ²⁹	60.00 ⁴²	06.803 ⁴⁰	27.42 ⁹⁴
Dec. 6.6	50.724 ¹²	46.94 ⁸⁰	56.322 ¹⁸	59.58 ⁴⁷	06.763 ¹³	26.48 ¹⁰⁴
16.6	50.736 ⁵⁴	47.74 ⁸⁷	56.340 ⁶⁶	59.11 ⁴⁹	06.776 ⁶⁷	25.44 ¹¹¹
26.5	50.790 ⁹⁵	48.61 ⁹¹	56.406 ¹¹³	58.62 ⁵⁰	06.843 ¹¹⁹	24.33 ¹¹⁴
36.5	50.885	49.52	56.519	58.12	06.962	23.19
Mean Place	47.927	53.20	52.957	61.47	03.127	26.86
Secδ, Tanδ	1.004	-0.087	1.130	-0.527	1.269	-0.782
a, a'	+3.2	+5.4	+3.8	+5.4	+4.1	+5.6
b, b'	0.00	+1.0	-0.01	+1.0	-0.01	+1.0
Authority and Catalogue No.	B.J.	1162	A.N.	1161	B.J.	1163

† Second transit, July 9

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	π Sagittarii		ψ Sagittarii		δ Draconis	
	3.02	F2	4.93	F5	3.24	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 19 05	[°] ['] -21 07	^h ^m 19 11	[°] ['] -25 22	^h ^m 19 12	[°] ['] +67 32
Jan. 1.5	53.580 ¹³³	47.59 ¹⁰	33.002 ¹³³	17.92 ³⁷	28.91 ²	49.97 ³⁴¹
11.5	53.713 ¹⁷²	47.49 ¹⁰	33.135 ¹⁷¹	17.55 ³⁹	28.89 ⁹	46.56 ³⁴⁴
21.5	53.885 ²⁰⁶	47.39 ¹³	33.306 ²⁰⁶	17.16 ⁴¹	28.98 ²⁰	43.12 ³³³
31.4	54.091 ²³⁴	47.26 ¹⁷	33.512 ²³⁸	16.75 ⁴³	29.18 ³⁰	39.79 ³⁰⁹
Feb. 10.4	54.325 ²⁶⁰	47.09 ²⁴	33.750 ²⁶³	16.32 ⁴⁸	29.48 ³⁸	36.70 ²⁷³
20.4	54.585 ²⁸⁰	46.85 ³¹	34.013 ²⁸⁴	15.84 ⁵²	29.86 ⁴⁷	33.97 ²²⁶
Mar. 2.4	54.865 ²⁹⁶	46.54 ⁴¹	34.297 ³⁰⁴	15.32 ⁵⁸	30.33 ⁵³	31.71 ¹⁷¹
12.3	55.161 ³¹⁰	46.13 ⁵¹	34.601 ³¹⁷	14.74 ⁶¹	30.86 ⁵⁷	30.00 ¹¹⁰
22.3	55.471 ³¹⁸	45.62 ⁵⁹	34.918 ³²⁷	14.13 ⁶⁹	31.43 ⁶¹	28.90 ⁴⁴
Apr. 1.3	55.789 ³²⁴	45.03 ⁶⁸	35.245 ³³²	13.44 ⁷³	32.04 ⁶¹	28.46 ²³
11.2	56.113 ³²⁴	44.35 ⁷⁵	35.577 ³³⁵	12.71 ⁷⁵	32.65 ⁶¹	28.69 ⁸⁸
21.2	56.437 ³²²	43.60 ⁷⁸	35.912 ³³³	11.96 ⁷³	33.26 ⁵⁸	29.57 ¹⁴⁸
May 1.2	56.759 ³¹²	42.82 ⁷⁹	36.245 ³²⁵	11.23 ⁷¹	33.84 ⁵⁴	31.05 ²⁰⁵
11.2	57.071 ²⁹⁸	42.03 ⁷⁷	36.570 ³¹⁰	10.52 ⁶⁵	34.38 ⁴⁹	33.10 ²⁵²
21.1	57.369 ²⁷⁸	41.26 ⁷¹	36.880 ²⁹⁰	09.87 ⁵⁷	34.87 ⁴¹	35.62 ²⁹³
31.1	57.647 ²⁵¹	40.55 ⁶⁴	37.170 ²⁶³	09.30 ⁴⁶	35.28 ³³	38.55 ³²⁴
June 10.1	57.898 ²¹⁹	39.91 ⁵⁵	37.433 ²³¹	08.84 ³⁴	35.61 ²⁴	41.79 ³⁴⁵
20.1	58.117 ¹⁸²	39.36 ⁴²	37.664 ¹⁹⁴	08.50 ²³	35.85 ¹⁵	45.24 ³⁵⁸
30.0	58.299 ¹⁴⁰	38.94 ³¹	37.858 ¹⁵⁰	08.27 ⁹	36.00 ⁵	48.82 ³⁶¹
July 10.0	58.439 ⁹⁵	38.63 ²⁰	38.008 ¹⁰⁴	08.18 ⁶	36.05 ⁵	52.43 ³⁵⁵
19.9	58.534 ⁴⁸	38.43 ⁸	38.112 ⁵⁵	08.24 ¹⁶	36.00 ¹⁵	55.98 ³⁴²
29.9	58.582 ²	38.35 ²	38.167 ⁷	08.40 ²⁴	35.85 ²⁴	59.40 ³²¹
Aug. 8.9	58.584 ⁴³	38.37 ⁹	38.174 ⁴⁰	08.64 ³⁰	35.61 ³³	62.61 ²⁹²
18.9	58.541 ⁸⁵	38.46 ¹⁶	38.134 ⁸⁴	08.94 ³⁵	35.28 ⁴¹	65.53 ²⁵⁹
28.9	58.456 ¹²⁰	38.62 ¹⁸	38.050 ¹¹⁹	09.29 ³⁵	34.87 ⁴⁸	68.12 ²¹⁸
Sept. 7.8	58.336 ¹⁴⁹	38.80 ¹⁸	37.931 ¹⁵¹	09.64 ³³	34.39 ⁵³	70.30 ¹⁷⁵
17.8	58.187 ¹⁶⁷	38.98 ¹⁸	37.780 ¹⁷¹	09.97 ²⁶	33.86 ⁵⁷	72.05 ¹²⁶
27.8	58.020 ¹⁷⁷	39.16 ¹⁴	37.609 ¹⁸¹	10.23 ¹⁹	33.29 ⁶⁰	73.31 ⁷⁵
Oct. 7.8	57.843 ¹⁷⁵	39.30 ⁹	37.428 ¹⁸¹	10.42 ¹¹	32.69 ⁶⁰	74.06 ²¹
17.7	57.668 ¹⁶²	39.39 ⁵	37.247 ¹⁶⁸	10.53 ¹	32.09 ⁵⁸	74.27 ³⁴
27.7	57.506 ¹⁴⁰	39.44 [—]	37.079 ¹⁴⁹	10.54 ⁸	31.51 ⁵⁶	73.93 ⁸⁹
Nov. 6.7	57.366 ¹¹⁰	39.44 ⁵	36.930 ¹¹⁶	10.46 ¹⁷	30.95 ⁵²	73.04 ¹⁴³
16.6	57.256 ⁷¹	39.39 ⁷	36.814 ⁷⁸	10.29 ²⁴	30.43 ⁴⁵	71.61 ¹⁹⁴
26.6	57.185 ³⁰	39.32 ⁸	36.736 ³⁶	10.05 ³⁰	29.98 ³⁷	69.67 ²⁴¹
Dec. 6.6	57.155 ¹⁶	39.24 ¹⁰	36.700 ¹¹	09.75 ³³	29.61 ²⁹	67.26 ²⁸⁰
16.6	57.171 ⁶⁰	39.14 ¹⁰	36.711 ⁵⁵	09.42 ³⁶	29.32 ¹⁹	64.46 ³¹³
26.5	57.231 ¹⁰⁴	39.04 ⁹	36.766 ¹⁰²	09.06 ³⁷	29.13 ⁹	61.33 ³³⁴
36.5	57.335	38.95	36.868	08.69	29.04	57.99
Mean Place	53.940	42.77	33.362	12.94	32.648	50.00
Sec δ , Tan δ	1.072	-0.386	1.107	-0.474	2.618	+2.420
a, a'	+3.6	+5.7	+3.7	+6.2	0.0	+6.2
b, b'	-0.01	+1.0	-0.01	+1.0	+0.05	+1.0
Authority and Catalogue No.	B.J.	1166	A.E.	1172	B.J.	1173

† Second transit, July 9

† First transit, July 10

APPARENT PLACES OF STARS, 1935

491

AT UPPER TRANSIT AT GREENWICH

Name	ω Aquilæ		δ Aquilæ		59 G Telescopii	
	5.14	A5	3.44	Fo	5.58	K2
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 19 ^m 14	[°] +11 ['] 28	^h 19 ^m 22	[°] + 2 ['] 58	^h 19 ^m 22	[°] -54 ['] 27
Jan. 1.5	45.294 ⁹⁶	33.99 ¹⁸²	12.781 ⁹⁷	58.59 ¹³³	34.654 ¹⁵³	31.67 ²¹⁴
11.5	45.390 ¹³³	32.17 ¹⁷⁹	12.878 ¹³³	57.26 ¹³⁰	34.807 ²¹⁸	29.53 ²¹⁵
21.5	45.523 ¹⁶⁷	30.38 ¹⁷⁰	13.011 ¹⁶⁶	55.96 ¹²²	35.025 ²⁷⁷	27.38 ²¹⁰
31.4	45.690 ¹⁹⁸	28.68 ¹⁵¹	13.177 ¹⁹⁵	54.74 ¹⁰⁶	35.302 ³²⁷	25.28 ²⁰¹
Feb. 10.4	45.888 ²²³	27.17 ¹²⁶	13.372 ²²⁰	53.68 ⁸⁷	35.629 ³⁷³	23.27 ¹⁸⁸
20.4	46.111 ²⁴⁷	25.91 ⁹⁵	13.592 ²⁴³	52.81 ⁶¹	36.002 ⁴¹¹	21.39 ¹⁷²
Mar. 2.4	46.358 ²⁶⁴	24.96 ⁶⁰	13.835 ²⁶²	52.20 ³¹	36.413 ⁴⁴²	19.67 ¹⁵³
12.3	46.622 ²⁸⁰	24.36 ¹⁹	14.097 ²⁷⁷	51.89 [—]	36.855 ⁴⁶⁷	18.14 ¹³²
22.3	46.902 ²⁹¹	24.17 ²¹	14.374 ²⁸⁸	51.89 ³⁴	37.322 ⁴⁸³	16.82 ¹⁰⁹
Apr. 1.3	47.193 ²⁹⁷	24.38 ⁶¹	14.662 ²⁹⁶	52.23 ⁶⁷	37.805 ⁴⁹⁵	15.73 ⁸⁴
11.3	47.490 ²⁹⁹	24.99 ¹⁰⁰	14.958 ²⁹⁹	52.90 ⁹⁷	38.300 ⁴⁹⁸	14.89 ⁵⁷
21.2	47.789 ²⁹⁶	25.99 ¹³³	15.257 ²⁹⁹	53.87 ¹²⁴	38.798 ⁴⁹³	14.32 ³⁰
May 1.2	48.085 ²⁸⁷	27.32 ¹⁶⁴	15.556 ²⁹¹	55.11 ¹⁴⁸	39.291 ⁴⁸¹	14.02 ¹
11.2	48.372 ²⁷³	28.96 ¹⁸⁷	15.847 ²⁷⁹	56.59 ¹⁶⁵	39.772 ⁴⁵⁹	14.01 ²⁸
21.1	48.645 ²⁵⁴	30.83 ²⁰⁶	16.126 ²⁶¹	58.24 ¹⁷⁷	40.231 ⁴²⁹	14.29 ⁵⁶
31.1	48.899 ²²⁷	32.89 ²¹⁷	16.387 ²³⁷	60.01 ¹⁸⁴	40.660 ³⁸⁹	14.85 ⁸⁴
June 10.1	49.126 ¹⁹⁶	35.06 ²²²	16.624 ²⁰⁸	61.85 ¹⁸⁵	41.049 ³⁴⁰	15.69 ¹⁰⁹
20.1	49.322 ¹⁶¹	37.28 ²²²	16.832 ¹⁷³	63.70 ¹⁸²	41.389 ²⁸²	16.78 ¹³²
30.0	49.483 ¹²¹	39.50 ²¹⁴	17.005 ¹³⁵	65.52 ¹⁷⁴	41.671 ²¹⁹	18.10 ¹⁴⁹
July 10.0	49.604 ⁷⁹	41.64 ²⁰⁴	17.140 ⁹³	67.26 ¹⁶²	41.890 ¹⁴⁹	19.59 ¹⁶³
19.9	49.683 ³⁴	43.68 ¹⁸⁷	17.233 ⁴⁹	68.88 ¹⁴⁷	42.039 ⁷⁷	21.22 ¹⁷¹
29.9	49.717 ⁹	45.55 ¹⁷⁰	17.282 ⁶	70.35 ¹³⁰	42.116 ³	22.93 ¹⁷³
Aug. 8.9	49.708 ⁵⁰	47.25 ¹⁴⁸	17.288 ³⁷	71.65 ¹¹¹	42.119 ⁶⁸	24.66 ¹⁶⁷
18.9	49.658 ⁹⁰	48.73 ¹²³	17.251 ⁷⁶	72.76 ⁹²	42.051 ¹³⁵	26.33 ¹⁵⁶
28.9	49.568 ¹²²	49.96 ⁹⁹	17.175 ¹⁰⁹	73.68 ⁷¹	41.916 ¹⁹⁴	27.89 ¹³⁸
Sept. 7.8	49.446 ¹⁴⁹	50.95 ⁷³	17.066 ¹³⁷	74.39 ⁵¹	41.722 ²⁴²	29.27 ¹¹³
17.8	49.297 ¹⁶⁷	51.68 ⁴⁶	16.929 ¹⁵⁶	74.90 ³⁰	41.480 ²⁷⁸	30.40 ⁸³
27.8	49.130 ¹⁷⁷	52.14 ¹⁸	16.773 ¹⁶⁷	75.20 ¹⁰	41.202 ²⁵⁸	31.23 ⁴⁸
Oct. 7.8	48.953 ¹⁷⁶	52.32 ¹⁰	16.606 ¹⁶⁸	75.30 ¹⁰	40.904 ³⁰⁴	31.71 ¹¹
17.7	48.777 ¹⁶⁷	52.22 ³⁷	16.438 ¹⁵⁹	75.20 ²⁹	40.600 ²⁹⁰	31.82 ²⁸
27.7	48.610 ¹⁴⁹	51.85 ⁶⁴	16.279 ¹⁴³	74.91 ⁴⁹	40.310 ²⁶³	31.54 ⁶⁷
Nov. 6.7	48.461 ¹²²	51.21 ⁹⁰	16.136 ¹¹⁶	74.42 ⁶⁷	40.047 ²²²	30.87 ¹⁰³
16.7	48.339 ⁹⁰	50.31 ¹¹⁵	16.020 ⁸⁴	73.75 ⁸⁵	39.825 ¹⁶⁷	29.84 ¹³⁶
26.6	48.249 ⁵³	49.16 ¹³⁸	15.936 ⁴⁹	72.90 ¹⁰¹	39.658 ¹⁰⁴	28.48 ¹⁶⁴
Dec. 6.6	48.196 ¹²	47.78 ¹⁵⁶	15.887 ⁹	71.89 ¹¹⁵	39.554 ³⁶	26.84 ¹⁸⁶
16.6	48.184 ²⁸	46.22 ¹⁷¹	15.878 ³⁰	70.74 ¹²⁵	39.518 ³⁵	24.98 ²⁰²
26.5	48.212 ⁷⁰	44.51 ¹⁷⁹	15.908 ⁷¹	69.49 ¹³¹	39.553 ¹⁰⁵	22.96 ²¹²
36.5	48.282	42.72	15.979	68.18	39.658	20.84
Mean Place	45.849	37.03	13.233	61.89	35.378	25.53
Sec δ , Tan δ	1.020	+ 0.203	1.001	+ 0.052	1.720	- 1.400
a, a'	+2.8	+ 6.4	+3.0	+ 7.0	+4.8	+ 7.1
b, b'	0.00	+ 0.9	0.00	+ 0.9	-0.03	+ 0.9
Authority and Catalogue No.	B.J.	1177	B.J.	1185	N.A.	1186

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	6 Vulpeculæ		β^1 Cygni		μ Aquilæ	
Mag. Spect.	4.63	Ma	3.24	Ko—Ao	4.65	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₉ ^m ₂₅	+ [°] ₂₄ ['] ₃₁	^h ₁₉ ^m ₂₈	+ [°] ₂₇ ['] ₄₉	^h ₁₉ ^m ₃₀	+ [°] ₇ ['] ₁₄
Jan. 1.5	59.167	54.15	05.069	18.11	54.290	20.28
11.5	59.238	51.74	05.135	15.58	54.374	18.74
21.5	59.350	49.34	05.243	13.04	54.496	17.21
31.5	59.501	47.04	05.390	10.61	54.651	15.78
Feb. 10.4	59.686	44.94	05.574	08.37	54.837	14.50
20.4	59.903	43.13	05.791	06.43	55.048	13.42
Mar. 2.4	60.146	41.68	06.036	04.87	55.283	12.65
12.3	60.414	40.67	06.306	03.76	55.537	12.19
22.3	60.699	40.14	06.596	03.14	55.809	12.09
Apr. 1.3	60.999	40.10	06.900	03.05	56.094	12.34
11.3	61.307	40.57	07.213	03.48	56.389	12.97
21.2	61.619	41.52	07.531	04.42	56.688	13.94
May 1.2	61.928	42.93	07.846	05.84	56.989	15.23
11.2	62.228	44.74	08.152	07.67	57.282	16.78
21.2	62.514	46.89	08.443	09.88	57.565	18.54
31.1	62.777	49.31	08.711	12.37	57.829	20.47
June 10.1	63.013	51.92	08.951	15.07	58.071	22.49
20.1	63.216	54.65	09.156	17.91	58.283	24.55
30.0	63.380	57.43	09.322	20.81	58.461	26.58
July 10.0	63.503	60.17	09.445	23.69	58.600	28.56
19.9	63.580	62.84	09.521	26.49	58.697	30.41
29.9	63.611	65.35	09.550	29.14	58.750	32.13
Aug. 8.9	63.596	67.66	09.532	31.59	58.760	33.66
18.9	63.536	69.73	09.468	33.80	58.727	34.99
28.9	63.435	71.52	09.363	35.72	58.655	36.11
Sept. 7.9	63.300	72.99	09.221	37.31	58.547	37.00
17.8	63.135	74.13	09.050	38.56	58.412	37.65
27.8	62.949	74.92	08.857	39.44	58.256	38.07
Oct. 7.8	62.752	75.34	08.650	39.93	58.088	38.26
17.7	62.552	75.38	08.442	40.02	57.920	38.20
27.7	62.359	75.04	08.241	39.70	57.756	37.90
Nov. 6.7	62.183	74.32	08.056	38.98	57.609	37.38
16.7	62.032	73.24	07.895	37.87	57.484	36.64
26.6	61.912	71.80	07.767	36.39	57.391	35.69
Dec. 6.6	61.829	70.05	07.675	34.57	57.333	34.53
16.6	61.787	68.04	07.624	32.46	57.314	33.22
26.6	61.787	65.81	07.617	30.13	57.331	31.77
36.5	61.830	63.45	07.654	27.65	57.390	30.26
Mean Place	59.937	55.62	05.912	19.18	54.775	22.91
Sec δ , Tan δ	1.099	+ 0.457	1.131	+ 0.528	1.008	+ 0.127
a, a'	+2.5	+ 7.3	+2.4	+ 7.5	+2.9	+ 7.7
b, b'	+0.01	+ 0.9	+0.01	+ 0.9	0.00	+ 0.9
Authority and Catalogue No.	N.A.	1190	B.J.	1193	A.E.	1197

APPARENT PLACES OF STARS, 1935

493

AT UPPER TRANSIT AT GREENWICH

Name	h Sagittarii		54 Sagittarii		f Sagittarii	
Mag. Spect.	4.66	B9	5.45	Ko	5.06	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 19 32	[°] ['] -25 01	^h ^m 19 36	[°] ['] -16 26	^h ^m 19 42	[°] ['] -19 54
Jan. 1.5	44.890 ¹⁰⁸	47.79 ⁴¹	59.709 ⁹⁸	41.30 ¹²	34.004 ⁹⁴	72.36 ¹¹
11.5	44.998 ¹⁴⁷	47.38 ⁴⁵	59.807 ¹³⁵	41.42 ⁸	34.098 ¹³²	72.25 ¹⁶
21.5	45.145 ¹⁸⁴	46.93 ⁴⁹	59.942 ¹⁶⁸	41.50 ²	34.230 ¹⁶⁶	72.09 ²⁰
31.5	45.329 ²¹⁵	46.44 ⁵³	60.110 ¹⁹⁸	41.52 ⁶	34.396 ¹⁹⁷	71.89 ³⁰
Feb. 10.4	45.544 ²⁴³	45.91 ⁵⁹	60.308 ²²⁶	41.46 ¹⁶	34.593 ²²⁶	71.59 ³⁷
20.4	45.787 ²⁶⁸	45.32 ⁶⁶	60.534 ²⁵⁰	41.30 ³⁰	34.819 ²⁵⁰	71.22 ⁴⁸
Mar. 2.4	46.055 ²⁸⁹	44.66 ⁷²	60.784 ²⁶⁷	41.00 ⁴²	35.069 ²⁶⁹	70.74 ⁵⁹
12.3	46.344 ³⁰⁵	43.94 ⁷⁹	61.051 ²⁸⁷	40.58 ⁵⁸	35.338 ²⁸⁹	70.15 ⁷¹
22.3	46.649 ³¹⁹	43.15 ⁸⁵	61.338 ³⁰⁰	40.00 ⁷³	35.627 ³⁰³	69.44 ⁸²
Apr. 1.3	46.968 ³²⁸	42.30 ⁸⁹	61.638 ³¹¹	39.27 ⁸⁶	35.930 ³¹⁶	68.62 ⁹¹
11.3	47.296 ³³⁵	41.41 ⁹¹	61.949 ³¹⁵	38.41 ⁹⁶	36.246 ³²²	67.71 ¹⁰¹
21.2	47.631 ³³⁵	40.50 ⁹¹	62.264 ³¹⁹	37.45 ¹⁰⁶	36.568 ³²⁵	66.70 ¹⁰⁵
May 1.2	47.966 ³³¹	39.59 ⁸⁸	62.583 ³¹⁵	36.39 ¹¹²	36.893 ³²¹	65.65 ¹⁰⁵
11.2	48.297 ³²⁰	38.71 ⁸²	62.898 ³⁰⁵	35.27 ¹¹¹	37.214 ³¹⁴	64.60 ¹⁰⁴
21.2	48.617 ³⁰²	37.89 ⁷²	63.203 ²⁸⁸	34.16 ¹⁰⁹	37.528 ²⁹⁵	63.56 ⁹⁹
31.1	48.919 ²⁷⁹	37.17 ⁶¹	63.491 ²⁶⁷	33.07 ¹⁰⁵	37.823 ²⁷⁷	62.57 ⁹¹
June 10.1	49.198 ²⁴⁸	36.56 ⁴⁸	63.758 ²³⁹	32.02 ⁹⁴	38.100 ²⁴⁶	61.66 ⁸⁰
20.1	49.446 ²¹²	36.08 ³⁴	63.997 ²⁰³	31.08 ⁸²	38.346 ²¹²	60.86 ⁶⁶
30.0	49.658 ¹⁷⁰	35.74 ¹⁸	64.200 ¹⁶³	30.26 ⁶⁹	38.558 ¹⁷³	60.20 ⁵¹
July 10.0	49.828 ¹²⁴	35.56 ³	64.363 ¹²³	29.57 ⁵⁵	38.731 ¹²⁹	59.69 ³⁵
19.9	49.952 ⁷⁶	35.53 ¹¹	64.486 ⁷⁴	29.02 ⁴⁰	38.860 ⁸²	59.34 ²¹
29.9	50.028 ²⁷	35.64 ²²	64.560 ²⁹	28.62 ²⁷	38.942 ³⁵	59.13 ⁸
Aug. 8.9	50.055 ²⁰	35.86 ³¹	64.589 ¹⁷	28.35 ¹⁴	38.977 ¹²	59.05 ⁵
18.9	50.035 ⁶⁶	36.17 ³⁷	64.572 ⁵⁹	28.21 ³	38.965 ⁵⁶	59.10 ¹⁴
28.9	49.969 ¹⁰⁶	36.54 ⁴⁰	64.513 ⁹⁸	28.18 ⁶	38.909 ⁹⁶	59.24 ²²
Sept. 7.9	49.863 ¹³⁹	36.94 ⁴⁰	64.415 ¹²⁸	28.24 ¹³	38.813 ¹²⁸	59.46 ²⁶
17.8	49.724 ¹⁶²	37.34 ³⁵	64.287 ¹⁵²	28.37 ¹⁸	38.685 ¹⁵²	59.72 ²⁶
27.8	49.562 ¹⁷⁸	37.69 ³⁰	64.135 ¹⁶⁴	28.55 ¹⁸	38.533 ¹⁶⁸	59.98 ²⁶
Oct. 7.8	49.384 ¹⁸⁰	37.99 ²¹	63.971 ¹⁶⁹	28.73 ²⁰	38.365 ¹⁷²	60.24 ²³
17.7	49.204 ¹⁷²	38.20 ¹²	63.802 ¹⁶²	28.93 ¹⁹	38.193 ¹⁶⁶	60.47 ¹⁹
27.7	49.032 ¹⁵⁵	38.32 ²	63.640 ¹⁴⁶	29.12 ¹⁹	38.027 ¹⁵⁰	60.66 ¹⁵
Nov. 6.7	48.877 ¹²⁷	38.34 ⁸	63.494 ¹²²	29.31 ¹⁷	37.877 ¹²⁹	60.81 ¹¹
16.7	48.750 ⁹³	38.26 ¹⁷	63.372 ⁹¹	29.48 ¹⁷	37.748 ⁹⁵	60.92 ⁴
26.6	48.657 ⁵³	38.09 ²⁴	63.281 ⁵²	29.65 ¹⁵	37.653 ⁵⁸	60.96 ¹
Dec. 6.6	48.604 ¹⁰	37.85 ³⁰	63.229 ¹³	29.80 ¹⁵	37.595 ¹⁹	60.97 ²
16.6	48.594 ³⁵	37.55 ³⁵	63.216 ²⁸	29.95 ¹⁴	37.576 ²⁴	60.95 ⁶
26.6	48.629 ⁷⁸	37.20 ³⁹	63.244 ⁷⁰	30.09 ¹³	37.600 ⁶⁷	60.89 ⁹
36.5	48.707	36.81	63.314	30.22	37.667	60.80
Mean Place	45.215	42.69	60.029	36.84	34.310	67.64
Secδ, Tanδ	1.104	-0.467	1.043	-0.295	1.064	-0.362
a, a'	+3.6	+7.9	+3.4	+8.2	+3.5	+8.7
b, b'	-0.01	+0.9	-0.01	+0.9	-0.01	+0.9
Authority and Catalogue No.	B.J.	1198	A.E.	1203	A.E.	1211

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	δ Cygni		γ Aquilæ		α Aquilæ (<i>Altair</i>)	
	2·98	Ao	2·80	K2	0·89	A5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 19 42	[°] ['] +44 57	^h ^m 19 43	[°] ['] +10 27	^h ^m 19 47	[°] ['] + 8 41
Jan. 1·5	55·097 ¹⁸	78·24 ³⁰²	09·617 ⁷⁰	11·46 ¹⁶⁷	36·200 ⁷⁰	41·88 ¹⁵⁵
11·5	55·115 ⁷³	75·22 ³⁰⁸	09·687 ¹⁰⁶	09·79 ¹⁶⁶	36·270 ¹⁰⁷	40·33 ¹⁵⁴
21·5	55·188 ¹²⁶	72·14 ³⁰¹	09·793 ¹⁴¹	08·13 ¹⁵⁸	36·377 ¹³⁹	38·79 ¹⁴⁶
31·5	55·314 ¹⁷⁶	69·13 ²⁸³	09·934 ¹⁷¹	06·55 ¹⁴³	36·516 ¹⁷²	37·33 ¹³⁰
Feb. 10·4	55·490 ²²¹	66·30 ²⁵³	10·105 ²⁰¹	05·12 ¹²⁰	36·688 ²⁰⁰	36·03 ¹⁰⁸
20·4	55·711 ²⁶⁴	63·77 ²¹³	10·306 ²²⁵	03·92 ⁹¹	36·888 ²²⁵	34·95 ⁸¹
Mar. 2·4	55·975 ³⁰⁰	61·64 ¹⁶⁵	10·531 ²⁴⁸	03·01 ⁵⁷	37·113 ²⁴⁶	34·14 ⁴⁹
12·4	56·275 ³³⁰	59·99 ¹⁰⁹	10·779 ²⁶⁷	02·44 ²¹	37·359 ²⁶⁷	33·65 ¹²
22·3	56·605 ³⁵²	58·90 ⁴²	11·046 ²⁸¹	02·23 ²⁰	37·626 ²⁸²	33·53 ²⁵
Apr. 1·3	56·957 ³⁶⁶	58·41 ¹³	11·327 ²⁹⁴	02·43 ⁵⁸	37·908 ²⁹³	33·78 ⁶³
11·3	57·323 ³⁷³	58·54 ⁷²	11·621 ³⁰⁰	03·01 ⁹⁶	38·201 ³⁰⁰	34·41 ⁹⁹
21·2	57·696 ³⁷¹	59·26 ¹³⁰	11·921 ³⁰¹	03·97 ¹³⁰	38·501 ³⁰²	35·40 ¹³²
May 1·2	58·067 ³⁶⁰	60·56 ¹⁸³	12·222 ²⁹⁸	05·27 ¹⁶⁰	38·803 ²⁹⁹	36·72 ¹⁶⁰
11·2	58·427 ³³⁹	62·39 ²³⁰	12·520 ²⁸⁷	06·87 ¹⁸⁴	39·102 ²⁸⁹	38·32 ¹⁸³
21·2	58·766 ³¹²	64·69 ²⁶⁹	12·807 ²⁷²	08·71 ²⁰³	39·391 ²⁷⁴	40·15 ²⁰¹
31·1	59·078 ²⁷⁶	67·38 ²⁹⁹	13·079 ²⁴⁸	10·74 ²¹⁶	39·665 ²⁵¹	42·16 ²¹¹
June 10·1	59·354 ²³³	70·37 ³²²	13·327 ²²⁰	12·90 ²²¹	39·916 ²²³	44·27 ²¹⁷
20·1	59·587 ¹⁸³	73·59 ³³⁵	13·547 ¹⁸⁷	15·11 ²²³	40·139 ¹⁹⁰	46·44 ²¹⁶
30·1	59·770 ¹³¹	76·94 ³⁴⁰	13·734 ¹⁴⁸	17·34 ²¹⁷	40·329 ¹⁵³	48·60 ²¹⁰
July 10·0	59·901 ⁷⁵	80·34 ³³⁸	13·882 ¹⁰⁶	19·51 ²⁰⁶	40·482 ¹¹⁰	50·70 ¹⁹⁹
19·9	59·976 ¹⁷	83·72 ³²⁶	13·988 ⁶²	21·57 ¹⁹²	40·592 ⁶⁶	52·69 ¹⁸⁵
29·9	59·993 ³⁹	86·98 ³⁰⁹	14·050 ¹⁸	23·49 ¹⁷⁴	40·658 ²²	54·54 ¹⁶⁷
Aug. 8·9	59·954 ⁹⁴	90·07 ²⁸⁴	14·068 ²⁶	25·23 ¹⁵⁴	40·680 ²¹	56·21 ¹⁴⁶
18·9	59·860 ¹⁴⁴	92·91 ²⁵⁴	14·042 ⁶⁶	26·77 ¹³⁰	40·659 ⁶²	57·67 ¹²³
28·9	59·716 ¹⁸⁹	95·45 ²¹⁹	13·976 ¹⁰²	28·07 ¹⁰⁶	40·597 ⁹⁷	58·90 ¹⁰⁰
Sept. 7·9	59·527 ²²⁵	97·64 ¹⁸⁰	13·874 ¹³²	29·13 ⁸¹	40·500 ¹²⁸	59·90 ⁷⁷
17·8	59·302 ²⁵⁴	99·44 ¹³⁷	13·742 ¹⁵⁴	29·94 ⁵⁵	40·372 ¹⁵⁰	60·67 ⁵¹
27·8	59·048 ²⁷²	100·81 ⁹¹	13·588 ¹⁶⁸	30·49 ²⁹	40·222 ¹⁶⁴	61·18 ²⁵
Oct. 7·8	58·776 ²⁸⁰	101·72 ⁴²	13·420 ¹⁷²	30·78 ²	40·058 ¹⁶⁹	61·43 ¹
17·8	58·496 ²⁷⁷	102·14 ⁸	13·248 ¹⁶⁷	30·80 ²⁴	39·889 ¹⁶⁴	61·44 ²³
27·7	58·219 ²⁶³	102·06 ⁵⁸	13·081 ¹⁵⁴	30·56 ⁵¹	39·725 ¹⁵¹	61·21 ⁴⁸
Nov. 6·7	57·956 ²³⁹	101·48 ¹⁰⁸	12·927 ¹³¹	30·05 ⁷⁵	39·574 ¹²⁹	60·73 ⁷¹
16·7	57·717 ²⁰⁶	100·40 ¹⁵⁶	12·796 ¹⁰⁴	29·30 ¹⁰⁰	39·445 ¹⁰¹	60·02 ⁹³
26·6	57·511 ¹⁶⁶	98·84 ²⁰⁰	12·692 ⁷⁰	28·30 ¹²¹	39·344 ⁶⁹	59·09 ¹¹⁴
Dec. 6·6	57·345 ¹²⁰	96·84 ²³⁸	12·622 ³⁴	27·09 ¹⁴⁰	39·275 ³²	57·95 ¹³⁰
16·6	57·225 ⁷⁰	94·46 ²⁷¹	12·588 ⁵	25·69 ¹⁵⁵	39·243 ⁶	56·65 ¹⁴⁴
26·6	57·155 ¹⁶	91·75 ²⁹³	12·593 ⁴³	24·14 ¹⁶³	39·249 ⁴⁴	55·21 ¹⁵²
36·5	57·139	88·82	12·636	22·51	39·293	53·69
Mean Place	56·516	76·61	10·124	13·24	36·680	43·74
Secδ, Tanδ	1·413	+ 0·999	1·017	+ 0·184	1·012	+ 0·153
a, a'	+1·9	+ 8·7	+2·9	+ 8·7	+2·9	+ 9·1
b, b'	+0·03	+ 0·9	+0·01	+ 0·9	+0·00	+ 0·9
Authority and Catalogue No.	B.J. 1213	B.J. 1214	A.E. 1218			

No. 1218. Corrected for a parallax of 0·20

† First transit, July 20

APPARENT PLACES OF STARS, 1935

495

AT UPPER TRANSIT AT GREENWICH

Name	ε Draconis		ι Sagittarii		β Aquilæ	
	4.03	Ko	4.21	Ko	3.90	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 19 ^m 48	+70° 05'	^h 19 ^m 50	-42° 02'	^h 19 ^m 52	+6° 14'
Jan. 1.5	19.84	73.03	46.541	32.71	06.743	33.62
11.5	19.71	69.77	46.639	31.22	06.808	32.20
21.5	19.70	66.40	46.786	29.66	06.909	30.78
31.5	19.81	63.03	46.976	28.07	07.043	29.44
Feb. 10.4	20.04	59.81	47.210	26.48	07.208	28.24
20.4	20.38	56.85	47.479	24.91	07.402	27.25
Mar. 2.4	20.82	54.28	47.780	23.37	07.621	26.51
12.4	21.34	52.19	48.110	21.90	07.863	26.09
22.3	21.94	50.67	48.464	20.51	08.125	26.00
Apr. 1.3	22.58	49.77	48.838	19.22	08.402	26.26
11.3	23.26	49.53	49.225	18.05	08.693	26.89
21.2	23.94	49.93	49.622	17.03	08.992	27.85
May 1.2	24.61	50.97	50.023	16.17	09.293	29.11
11.2	25.26	52.61	50.421	15.51	09.593	30.64
21.2	25.85	54.77	50.809	15.07	09.885	32.39
31.1	26.37	57.41	51.179	14.87	10.161	34.29
June 10.1	26.82	60.42	51.521	14.90	10.417	36.29
20.1	27.17	63.73	51.829	15.16	10.646	38.34
30.1	27.40	67.24	52.096	15.66	10.842	40.37
July 10.0	27.55	70.88	52.315	16.36	11.001	42.33
20.0	27.58†	74.53	52.478†	17.26	11.119	44.19
29.9	27.49	78.14	52.584	18.30	11.193	45.91
Aug. 8.9	27.30	81.61	52.630	19.44	11.222	47.45
18.9	27.01	84.86	52.619	20.64	11.208	48.79
28.9	26.62	87.84	52.551	21.83	11.153	49.92
Sept. 7.9	26.15	90.48	52.433	22.98	11.061	50.82
17.8	25.61	92.72	52.270	23.99	10.938	51.50
27.8	25.01	94.52	52.076	24.85	10.793	51.95
Oct. 7.8	24.37	95.83	51.860	25.48	10.632	52.17
17.8	23.71	96.62	51.635	25.88	10.466	52.16
27.7	23.04	96.86	51.414	25.99	10.303	51.92
Nov. 6.7	22.39	96.54	51.209	25.83	10.152	51.47
16.7	21.78	95.66	51.032	25.38	10.022	50.80
26.6	21.21	94.22	50.893	24.66	09.919	49.94
Dec. 6.6	20.72	92.27	50.800	23.72	09.848	48.89
16.6	20.31	89.85	50.755	22.58	09.813	47.68
26.6	20.00	87.03	50.763	21.28	09.814	46.35
36.5	19.80	83.92	50.824	19.85	09.854	44.95
Mean Place	24.080	68.91	46.934	20.17	07.183	35.47
Secδ, Tanδ	2.938	+2.763	1.347	-0.902	1.006	+0.109
a, a'	-0.2	+9.1	+4.1	+9.3	+2.9	+9.4
b, b'	+0.08	+0.9	-0.03	+0.9	0.00	+0.9
Authority and Catalogue No.	B.J.	1219	A.E.	1221	B.J.	1222

† First transit, July 20

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ϵ Pavonis		g Sagittarii		c Sagittarii	
Mag. Spect.	4.10	Ao	5.05	Ao	4.60	Mb
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₁₉ ^m ₅₃	[°] ₋₇₃ ['] ₀₄	^h ₁₉ ^m ₅₄	[°] ₋₁₅ ['] ₃₉	^h ₁₉ ^m ₅₈	[°] ₋₂₇ ['] ₅₃
Jan. 1.6	04.56	73.88	15.619	59.30	39.566	36.46
11.5	04.66	70.82	15.698	59.42	39.647	35.82
21.5	04.90	67.70	15.813	59.49	39.768	35.11
31.5	05.27	64.62	15.963	59.50	39.926	34.34
Feb. 10.4	05.76	61.63	16.144	59.42	40.119	33.50
20.4	06.35	58.81	16.353	59.22	40.342	32.60
Mar. 2.4	07.03	56.21	16.587	58.88	40.593	31.65
12.4	07.79	53.89	16.843	58.40	40.869	30.64
22.3	08.61	51.89	17.119	57.75	41.166	29.57
Apr. 1.3	09.49	50.25	17.412	56.95	41.481	28.47
11.3	10.39	49.00	17.716	56.01	41.810	27.35
21.3	11.31	48.14	18.030	54.95	42.149	26.23
May 1.2	12.23	47.70	18.348	53.79	42.493	25.15
11.2	13.14	47.69	18.665	52.58	42.836	24.13
21.2	14.01	48.11	18.974	51.35	43.172	23.20
31.1	14.83	48.94	19.270	50.14	43.495	22.40
June 10.1	15.58	50.17	19.546	48.98	43.797	21.75
20.1	16.24	51.75	19.796	47.92	44.070	21.26
30.1	16.79	53.66	20.012	46.98	44.309	20.95
July 10.0	17.23	55.82	20.191	46.17	44.508	20.83
20.0	17.53	58.18	20.327	45.53	44.661	20.88
29.9	17.69	60.66	20.419	45.03	44.765	21.10
Aug. 8.9	17.72	63.18	20.463	44.70	44.818	21.46
18.9	17.60	65.64	20.461	44.51	44.821	21.93
28.9	17.35	67.97	20.416	44.45	44.776	22.48
Sept. 7.9	16.98	70.06	20.332	44.50	44.688	23.07
17.8	16.49	71.83	20.214	44.63	44.563	23.66
27.8	15.93	73.21	20.071	44.82	44.409	24.21
Oct. 7.8	15.30	74.14	19.912	45.05	44.235	24.69
17.8	14.65	74.54	19.746	45.29	44.054	25.06
27.7	13.99	74.41	19.583	45.54	43.875	25.30
Nov. 6.7	13.36	73.74	19.434	45.78	43.709	25.41
16.7	12.79	72.54	19.305	46.01	43.565	25.37
26.7	12.31	70.85	19.206	46.23	43.453	25.19
Dec. 6.6	11.93	68.73	19.141	46.43	43.377	24.89
16.6	11.67	66.23	19.114	46.62	43.342	24.47
26.6	11.55	63.46	19.126	46.79	43.349	23.96
36.5	11.56	60.48	19.178	46.94	43.400	23.37
Mean Place	06.470	66.04	15.908	55.04	39.842	30.95
Secd, Tan δ	3.437	-3.288	1.039	-0.280	1.131	-0.529
a, a'	+6.9	+9.5	+3.4	+9.6	+3.7	+9.9
b, b'	-0.10	+0.9	-0.01	+0.9	-0.02	+0.9
Authority and Catalogue No.	B.J.	1223	N.A.	1227	A.N.	1231

APPARENT PLACES OF STARS, 1935

497

AT UPPER TRANSIT AT GREENWICH

Name	δ Pavonis		θ Aquilæ		4 Capricorni	
	3·64	G5	3·37	Ao	5·96	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 20 ^m 02	[°] —66 ['] 20	^h 20 ^m 07	[°] —1 ['] 00	^h 20 ^m 14	[°] —22 ['] 00
Jan. 1·6	20·96	68·25	56·735	58·01	12·172	48·82
11·5	21·05 ⁹	65·51 ²⁷⁴	56·791 ⁵⁶	58·98 ⁹⁷	12·233 ⁶¹	48·51 ³¹
21·5	21·23 ¹⁸	62·68 ²⁸³	56·882 ⁹¹	59·91 ⁹³	12·332 ⁹⁹	48·14 ³⁷
31·5	21·50 ²⁷	59·84 ²⁸⁴	57·006 ¹²⁴	60·78 ⁸⁷	12·467 ¹³⁵	47·68 ⁴⁶
Feb. 10·5	21·86 ³⁶	57·06 ²⁷⁸	57·161 ¹⁵⁵	61·52 ⁷⁴	12·634 ¹⁶⁷	47·14 ⁵⁴
	21·86 ⁴³	57·06 ²⁶⁶	57·161 ¹⁸³	61·52 ⁵⁶	12·634 ¹⁹⁹	47·14 ⁶⁵
20·4	22·29	54·40	57·344	62·08	12·833	46·49
Mar. 2·4	22·78 ⁴⁹	51·91 ²⁴⁹	57·553 ²⁰⁹	62·43 ³⁵	13·058 ²²⁵	45·74 ⁷⁵
12·4	23·34 ⁵⁶	49·64 ²²⁷	57·786 ²³³	62·51 ⁸	13·309 ²⁵¹	44·87 ⁸⁷
22·3	23·94 ⁶⁰	47·63 ²⁰¹	58·040 ²⁵⁴	62·32 ¹⁹	13·582 ²⁷³	43·90 ⁹⁷
Apr. 1·3	24·58 ⁶⁴	45·92 ¹⁷¹	58·312 ²⁷²	61·84 ⁴⁸	13·875 ²⁹³	42·83 ¹⁰⁷
	24·58 ⁶⁷	45·92 ¹³⁷	58·312 ²⁸⁸	61·84 ⁷⁷	13·875 ³⁰⁹	42·83 ¹¹⁵
11·3	25·25	44·55	58·600	61·07	14·184	41·68
21·3	25·94 ⁶⁹	43·52 ¹⁰³	58·898 ²⁹⁸	60·04 ¹⁰³	14·506 ³²²	40·47 ¹²¹
May 1·2	26·63 ⁶⁹	42·88 ⁶⁴	59·202 ³⁰⁴	58·76 ¹²⁸	14·835 ³²⁹	39·22 ¹²⁵
11·2	27·32 ⁶⁹	42·63 ²⁵	59·507 ³⁰⁵	57·29 ¹⁴⁷	15·167 ³³²	37·99 ¹²³
21·2	27·98 ⁶⁶	42·77 ¹⁴	59·806 ²⁹⁹	55·66 ¹⁶³	15·493 ³²⁶	36·79 ¹²⁰
	27·98 ⁶³	42·77 ⁵³	59·806 ²⁸⁸	55·66 ¹⁷³	15·493 ³¹⁷	36·79 ¹¹⁰
31·2	28·61	43·30	60·094	53·93	15·810	35·69
June 10·1	29·20 ⁵⁹	44·22 ⁹²	60·363 ²⁶⁹	52·14 ¹⁷⁹	16·108 ²⁹⁸	34·68 ¹⁰¹
20·1	29·72 ⁵²	45·49 ¹²⁷	60·608 ²⁴⁵	50·36 ¹⁷⁸	16·381 ²⁷³	33·82 ⁸⁶
30·1	30·17 ⁴⁵	47·07 ¹⁵⁸	60·820 ²¹²	48·61 ¹⁷⁵	16·622 ²⁴¹	33·12 ⁷⁰
July 10·0	30·53 ³⁶	48·94 ¹⁸⁷	60·998 ¹⁷⁸	46·96 ¹⁶⁵	16·826 ²⁰⁴	32·59 ⁵³
	30·53 ²⁷	48·94 ²⁰⁸	60·998 ¹³⁷	46·96 ¹⁵³	16·826 ¹⁶¹	32·59 ³⁴
20·0	30·80 ²³	51·02	61·135	45·43	16·987	32·25
29·9	30·97 ¹⁷	53·26 ²²⁴	61·229 ²⁵	44·06 ¹³⁷	17·102 ¹¹⁵	32·09 ¹⁶
Aug. 8·9	31·03 ⁶	55·57 ²³¹	61·278 ⁴⁹	42·86 ¹²⁰	17·169 ⁶⁷	32·09
18·9	30·99 ⁴	57·87 ²³⁰	61·283 ⁵	41·85 ¹⁰¹	17·186 ¹⁷	32·24 ¹⁵
28·9	30·85 ¹⁴	60·08 ²²¹	61·245 ³⁸	41·03 ⁸²	17·158 ²⁸	32·51 ²⁷
	30·85 ²⁴	60·08 ²⁰³	61·245 ⁷⁶	41·03 ⁶⁴	17·158 ⁷²	32·51 ³⁷
Sept. 7·9	30·61	62·11	61·169	40·39	17·086	32·88
17·9	30·30 ³¹	63·88 ¹⁷⁷	61·061 ¹⁰⁸	39·95 ⁴⁴	16·978 ¹⁰⁸	33·30 ⁴²
27·8	29·92 ³⁸	65·31 ¹⁴³	60·927 ¹³⁴	39·69 ²⁶	16·840 ¹³⁸	33·73 ⁴³
Oct. 7·8	29·49 ⁴³	66·33 ¹⁰²	60·777 ¹⁵⁰	39·59 ¹⁰	16·683 ¹⁵⁷	34·16 ⁴³
17·8	29·04 ⁴⁵	66·91 ⁵⁸	60·618 ¹⁵⁹	39·66 ⁷	16·514 ¹⁶⁹	34·55 ³⁹
	29·04 ⁴⁶	66·91 ⁸	60·618 ¹⁵⁸	39·66 ²³	16·514 ¹⁶⁸	34·55 ³³
27·7	28·58	66·99	60·460	39·89	16·346	34·88
Nov. 6·7	28·15 ⁴³	66·58 ⁴¹	60·312 ¹⁴⁸	40·24 ³⁵	16·187 ¹⁵⁹	35·12 ²⁴
16·7	27·75 ⁴⁰	65·67 ⁹¹	60·182 ¹³⁰	40·75 ⁵¹	16·047 ¹⁴⁰	35·28 ¹⁶
26·7	27·42 ³³	64·30 ¹³⁷	60·077 ¹⁰⁵	41·38 ⁶³	15·933 ¹¹⁴	35·35 ⁷
Dec. 6·6	27·16 ²⁶	62·52 ¹⁷⁸	60·002 ⁷⁵	42·12 ⁷⁴	15·852 ⁸¹	35·33 ²
	27·16 ¹⁸	62·52 ²¹⁵	60·002 ⁴¹	42·12 ⁸⁵	15·852 ⁴⁵	35·33 ⁹
16·6	26·98	60·37	59·961	42·97	15·807	35·24
26·6	26·90 ⁸	57·93 ²⁴⁴	59·955 ⁶	43·89 ⁹²	15·802 ⁵	35·06 ¹⁸
36·6	26·92 ²	55·28 ²⁶⁵	59·986 ³¹	44·84 ⁹⁵	15·835 ³³	34·81 ²⁵
Mean Place	22·097	60·11	57·073	55·81	12·403	43·93
Secδ, Tanδ	2·493	— 2·283	1·000	— 0·018	1·079	— 0·404
a, a'	+5·7	+10·2	+3·1	+10·6	+3·5	+11·1
b, b'	—0·08	+ 0·9	0·00	+ 0·8	—0·01	+ 0·8
Authority and Catalogue No.	B.J.	1233	B.J.	1237	N.A.	1250

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	α^1 Capricorni		β Capricorni		γ Cygni	
Mag. Spect.	3.77	G5	3.25	Go—Ao	2.32	F8p
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 20 ^m 14	[°] —12 ['] 44	^h 20 ^m 17	[°] —14 ['] 59	^h 20 ^m 19	[°] +40 ['] 02
Jan. 1.6	26.712	55.03	21.423	20.56	52.540	55.95
11.5	26.769	55.30	21.478	20.68	52.527	53.24
21.5	26.862	55.50	21.569	20.74	52.561	50.43
31.5	26.988	55.63	21.694	20.71	52.643	47.61
Feb. 10.5	27.145	55.65	21.851	20.58	52.771	44.90
20.4	27.332	55.53	22.037	20.32	52.943	42.43
Mar. 2.4	27.545	55.25	22.250	19.91	53.157	40.28
12.4	27.783	54.80	22.488	19.35	53.408	38.55
22.3	28.042	54.16	22.748	18.62	53.694	37.31
Apr. 1.3	28.320	53.34	23.028	17.72	54.007	36.62
11.3	28.615	52.34	23.324	16.67	54.341	36.51
21.3	28.921	51.19	23.632	15.48	54.691	36.97
May 1.2	29.235	49.91	23.948	14.20	55.048	37.99
11.2	29.551	48.55	24.267	12.85	55.403	39.54
21.2	29.863	47.14	24.583	11.48	55.749	41.56
31.2	30.164	45.73	24.888	10.13	56.075	44.00
June 10.1	30.449	44.36	25.176	08.83	56.375	46.76
20.1	30.708	43.06	25.441	07.63	56.640	49.78
30.1	30.937	41.89	25.675	06.55	56.865	52.98
July 10.0	31.131	40.85	25.873	05.62	57.043	56.27
20.0	31.283	39.97	26.029	04.86	57.170	59.57
29.9	31.391	39.25	26.142	04.27	57.244	62.81
Aug. 8.9	31.453	38.72	26.208	03.85	57.264	65.93
18.9	31.469	38.35	26.227	03.60	57.231	68.85
28.9	31.440	38.13	26.202	03.50	57.147	71.51
Sept. 7.9	31.372	38.05	26.136	03.53	57.018	73.87
17.9	31.268	38.09	26.034	03.66	56.849	75.88
27.8	31.138	38.22	25.904	03.88	56.648	77.50
Oct. 7.8	30.988	38.42	25.755	04.15	56.424	78.71
17.8	30.828	38.67	25.595	04.44	56.186	79.46
27.7	30.669	38.96	25.434	04.75	55.945	79.75
Nov. 6.7	30.519	39.27	25.282	05.06	55.710	79.56
16.7	30.387	39.59	25.148	05.35	55.491	78.89
26.7	30.280	39.92	25.038	05.62	55.294	77.75
Dec. 6.6	30.203	40.25	24.959	05.87	55.129	76.17
16.6	30.161	40.58	24.914	06.09	55.000	74.19
26.6	30.155	40.89	24.906	06.29	54.913	71.87
36.6	30.187	41.18	24.935	06.44	54.870	69.28
Mean Place	26.963	51.37	21.658	16.61	53.647	51.62
Secδ, Tanδ	1.025	— 0.226	1.035	— 0.268	1.306	+ 0.840
a, a'	+3.3	+11.1	+3.4	+11.3	+2.2	+11.5
b, b'	—0.01	+ 0.8	—0.01	+ 0.8	+0.03	+ 0.8
Authority and Catalogue No.	B.J.	1251	A.N.	1252	B.J.	1255

APPARENT PLACES OF STARS, 1935

499

AT UPPER TRANSIT AT GREENWICH

Name	α Pavonis		ρ Capricorni		ε Delphini	
	2.12	B ₃	5.06	F ₀	3.98	B ₅
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 20 20	^m —56 56	^h 20 25	^m —18 01	^h 20 30	^m +11 04
Jan. 1.6	30.459	50.59	09.064	51.40	05.996	53.25
11.5	30.508	48.29	09.113	51.33	06.021	51.71
21.5	30.625	45.85	09.198	51.18	06.081	50.16
31.5	30.805	43.35	09.317	50.94	06.174	48.66
Feb. 10.5	31.047	40.84	09.468	50.59	06.300	47.27
20.4	31.344	38.36	09.650	50.13	06.458	46.09
Mar. 2.4	31.690	35.98	09.860	49.53	06.644	45.16
12.4	32.082	33.73	10.095	48.79	06.858	44.53
22.4	32.512	31.65	10.354	47.91	07.097	44.27
Apr. 1.3	32.975	29.78	10.633	46.88	07.358	44.38
11.3	33.464	28.16	10.930	45.73	07.638	44.88
21.3	33.973	26.81	11.241	44.49	07.933	45.76
May 1.2	34.492	25.76	11.562	43.17	08.237	46.99
11.2	35.013	25.04	11.886	41.81	08.544	48.55
21.2	35.526	24.67	12.208	40.46	08.849	50.37
31.2	36.020	24.65	12.521	39.16	09.144	52.40
June 10.1	36.484	24.99	12.818	37.94	09.422	54.59
20.1	36.908	25.67	13.091	36.83	09.677	56.87
30.1	37.280	26.67	13.335	35.87	09.902	59.19
July 10.1	37.592	27.97	13.543	35.08	10.091	61.46
20.0	37.835	29.51	13.710	34.47	10.241	63.66
29.9	38.004	31.25	13.831	34.04	10.348	65.74
Aug. 8.9	38.094	33.14	13.906	33.78	10.409	67.65
18.9	38.105	35.09	13.934	33.70	10.427	69.36
28.9	38.039	37.02	13.916	33.77	10.400	70.85
Sept. 7.9	37.900	38.86	13.855	33.95	10.335	72.10
17.9	37.698	40.53	13.757	34.23	10.235	73.10
27.8	37.444	41.95	13.630	34.57	10.106	73.84
Oct. 7.8	37.151	43.06	13.481	34.93	09.958	74.32
17.8	36.835	43.81	13.321	35.30	09.799	74.53
27.8	36.513	44.15	13.158	35.66	09.636	74.48
Nov. 6.7	36.201	44.06	13.003	35.97	09.480	74.17
16.7	35.915	43.54	12.864	36.23	09.337	73.61
26.7	35.670	42.61	12.749	36.44	09.215	72.80
Dec. 6.6	35.475	41.28	12.664	36.60	09.119	71.77
16.6	35.341	39.61	12.613	36.69	09.053	70.55
26.6	35.273	37.65	12.598	36.73	09.020	69.17
36.6	35.274	35.46	12.620	36.70	09.021	67.67
Mean Place	31.040	42.17	09.270	47.09	06.405	52.72
Secδ, Tanδ	1.833	— 1.537	1.052	— 0.326	1.019	+ 0.196
a, a'	+4.8	+11.5	+3.4	+11.9	+2.9	+12.2
b, b'	—0.06	+ 0.8	—0.01	+ 0.8	+0.01	+ 0.8
Authority and Catalogue No.	B.J.	1256	A.N.	1258	B.J.	1267

† Second transit, July 29

† First transit, July 30

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	α Indi		α Delphini		β Pavonis	
Mag. Spect.	3.21	Ko	3.86	B8	3.60	A5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 20 ^m 32	[°] -47 ['] 30	^h 20 ^m 36	[°] +15 ['] 40	^h 20 ^m 39	[°] -66 ['] 25
Jan. 1.6	59.920	78.32 180	36.619	56.04 173	06.61	88.12 272
11.6	59.957 ³⁷	76.52 180	36.634 15	54.31 176	06.59 ²	85.40 289
21.5	60.046 ⁸⁹	74.57 195	36.683 49	52.55 174	06.67 ⁸	82.51 300
31.5	60.186 ¹⁴⁰	72.53 204	36.767 84	50.81 161	06.84 ¹⁷	79.51 302
Feb. 10.5	60.373 ¹⁸⁷	70.42 211	36.884 117	49.20 143	07.09 ²⁵	76.49 297
20.4	60.605 ²³²	68.30 212	37.034 150	47.77 116	07.43 ³⁴	73.52 287
Mar. 2.4	60.878 ²⁷³	66.19 211	37.215 181	46.61 83	07.84 ⁴¹	70.65 272
12.4	61.188 ³¹⁰	64.13 206	37.424 209	45.78 46	08.31 ⁴⁷	67.93 249
22.4	61.531 ³⁴³	62.17 196	37.661 237	45.32 5	08.84 ⁵³	65.44 223
Apr. 1.3	61.903 ³⁷²	60.32 185	37.921 260	45.27 38	09.43 ⁵⁹	63.21 193
11.3	62.300 ³⁹⁷	58.62 170	38.200 279	45.65 78	10.05 ⁶²	61.28 158
21.3	62.717 ⁴¹⁷	57.10 152	38.497 297	46.43 118	10.70 ⁶⁵	59.70 121
May 1.3	63.145 ⁴²⁸	55.82 128	38.803 306	47.61 154	11.38 ⁶⁸	58.49 82
11.2	63.579 ⁴³⁴	54.78 104	39.114 311	49.15 185	12.06 ⁶⁸	57.67 ⁴⁰
21.2	64.011 ⁴³²	54.02 76	39.423 309	51.00 210	12.73 ⁶⁷	57.27 ²
31.2	64.431 ⁴²⁰	53.55 47	39.722 299	53.10 230	13.39 ⁶⁶	57.29 44
June 10.1	64.829 ³⁹⁸	53.40 15	40.005 283	55.40 242	14.00 ⁶¹	57.73 85
20.1	65.198 ³⁶⁹	53.55 46	40.265 260	57.82 248	14.57 ⁵⁷	58.58 122
30.1	65.526 ³²⁸	54.01 75	40.494 225	60.30 249	15.07 ⁵⁰	59.80 157
July 10.1	65.807 ²⁸¹	54.76 101	40.688 194	62.79 243	15.50 ⁴³	61.37 187
20.0	66.033 ²²⁶	55.77 123	40.842 154	65.22 231	15.84 ³⁴	63.24 211
30.0	66.198 ¹⁶⁵	57.00 141	40.952 66	67.53 216	16.08 ²⁴	65.35 226
Aug. 8.9	66.299 ¹⁰¹	58.41 152	41.018 19	69.69 197	16.22 ¹⁴	67.61 234
18.9	66.335 ³⁶	59.93 157	41.037 24	71.66 174	16.25 ³	69.95 233
28.9	66.307 ²⁸	61.50 155	41.013 65	73.40 149	16.17 ⁸	72.28 223
Sept. 7.9	66.218 ⁸⁹	63.05 146	40.948 99	74.89 122	16.00 ¹⁷	74.51 205
17.9	66.077 ¹⁴¹	64.51 131	40.849 129	76.11 94	15.73 ²⁷	76.56 176
27.8	65.890 ¹⁸⁷	65.82 107	40.720 150	77.05 65	15.39 ³⁴	78.32 141
Oct. 7.8	65.672 ²¹⁸	66.89 81	40.570 163	77.70 35	15.00 ³⁹	79.73 99
17.8	65.432 ²⁴⁰	67.70 50	40.407 166	78.05 5	14.55 ⁴⁵	80.72 52
27.8	65.185 ²⁴⁷	68.20 15	40.241 161	78.10 26	14.09 ⁴⁶	81.24 —
Nov. 6.7	64.944 ²⁴¹	68.35 20	40.080 150	77.84 55	13.64 ⁴⁵	81.24 50
16.7	64.722 ²²²	68.15 55	39.930 130	77.29 83	13.20 ⁴⁴	80.74 100
26.7	64.530 ¹⁹²	67.60 89	39.800 105	76.46 109	12.82 ³⁸	79.74 148
Dec. 6.7	64.379 ¹⁵¹	66.71 119	39.695 76	75.37 134	12.49 ³³	78.26 190
16.6	64.273 ¹⁰⁶	65.52 145	39.619 44	74.03 152	12.23 ²⁶	76.36 227
26.6	64.219 ⁵⁴	64.07 168	39.575 9	72.51 168	12.06 ¹⁷	74.09 257
36.6	64.218 ¹	62.39	39.566	70.83	11.98 ⁸	71.52
Mean Place	60.237	70.27	37.074	54.39	07.507	78.47
Secd. Tan δ	1.481	- 1.092	1.039	+ 0.281	2.502	- 2.293
a, a'	+4.2	+12.4	+2.8	+12.7	+5.4	+12.8
b, b'	-0.05	+ 0.8	+0.01	+ 0.8	-0.10	+ 0.8
Authority and Catalogue No.	B.J.	1270	B.I.	1277	B.J.	1279

APPARENT PLACES OF STARS, 1935

501

AT UPPER TRANSIT AT GREENWICH

Name	α Cygni (<i>Deneb</i>)		ϵ Cygni		η Cephei	
Mag. Spect.	1.33	A2p	2.64	Ko	3.59	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 20 ^m 39	[°] +45 ['] 02	^h 20 ^m 43	[°] +33 ['] 43	^h 20 ^m 43	[°] +61 ['] 34
Jan. 1.6	11.602	56.91	33.931	38.34	55.76	78.54
11.6	11.552 ⁵⁰	54.20 ²⁷¹	33.910 ²¹	35.96 ²³⁸	55.61 ¹⁵	75.68 ²⁸⁶
21.5	11.553 ¹	51.33 ²⁸⁷	33.929 ¹⁹	33.46 ²⁵⁰	55.53 ⁸	72.59 ³⁰⁹
31.5	11.604 ⁵¹	48.41 ²⁹²	33.990 ⁶¹	30.94 ²⁵²	55.54 ¹	69.39 ³²⁰
Feb. 10.5	11.705 ¹⁰¹	45.55 ²⁸⁶	34.093 ¹⁰³	28.49 ²⁴⁵	55.62 ⁸	66.20 ³¹⁹
	153	267	142	226	17	304
20.4	11.858	42.88	34.235	26.23	55.79	63.16
Mar. 2.4	12.058 ²⁰⁰	40.50 ²³⁸	34.417 ¹⁸²	24.26 ¹⁹⁷	56.03 ²⁴	60.38 ²⁷⁸
12.4	12.303 ²⁴⁵	38.52 ¹⁹⁸	34.636 ²¹⁹	22.66 ¹⁶⁰	56.35 ³²	57.98 ²⁴⁰
22.4	12.588 ²⁸⁵	37.02 ¹⁵⁰	34.889 ²⁵³	21.50 ¹¹⁶	56.73 ³⁸	56.06 ¹⁹²
Apr. 1.3	12.908 ³²⁰	36.05 ⁹⁷	35.171 ²⁸²	20.84 ⁶⁶	57.17 ⁴⁴	54.70 ¹³⁶
	348	38	306	14	47	77
11.3	13.256	35.67	35.477	20.70	57.64	53.93
21.3	13.623 ³⁶⁷	35.87 ²⁰	35.803 ³²⁶	21.11 ⁴¹	58.15 ⁵¹	53.80 ¹³
May 1.3	14.002 ³⁷⁹	36.66 ⁷⁹	36.140 ³³⁷	22.04 ⁹³	58.67 ⁵²	54.31 ⁵¹
11.2	14.383 ³⁸¹	38.01 ¹³⁵	36.482 ³⁴²	23.47 ¹⁴³	59.19 ⁵²	55.42 ¹¹¹
21.2	14.757 ³⁷⁴	39.87 ¹⁸⁶	36.820 ³³⁸	25.34 ¹⁸⁷	59.69 ⁵⁰	57.12 ¹⁷⁰
	356	231	326	227	48	221
31.2	15.113	42.18	37.146	27.61	60.17	59.33
June 10.1	15.443 ³³⁰	44.88 ²⁷⁰	37.451 ³⁰⁵	30.20 ²⁵⁹	60.60 ⁴³	62.00 ²⁶⁷
20.1	15.739 ²⁹⁶	47.88 ³⁰⁰	37.730 ²⁷⁹	33.04 ²⁸⁴	60.98 ³⁸	65.05 ³⁰⁵
30.1	15.992 ²⁵³	51.12 ³²⁴	37.972 ²⁴²	36.07 ³⁰³	61.30 ³²	68.40 ³³⁵
July 10.1	16.197 ²⁰⁵	54.49 ³³⁷	38.175 ²⁰³	39.18 ³¹¹	61.55 ²⁵	71.96 ³⁵⁶
	151	343	157	314	17	367
20.0	16.348	57.92	38.332	42.32	61.72	75.63
30.0	16.444 ⁹⁶	61.33 ³⁴¹	38.441 ¹⁰⁹	45.41 ³⁰⁹	61.81 ⁹	79.35 ³⁷²
Aug. 8.9	16.482 ³⁸	64.65 ³³²	38.499 ⁵⁸	48.38 ²⁹⁷	61.82 ¹	83.03 ³⁶⁸
18.9	16.463 ¹⁹	67.81 ³¹⁶	38.507 ⁸	51.19 ²⁸¹	61.75 ⁷	86.59 ³⁵⁶
28.9	16.389 ⁷⁴	70.75 ²⁹⁴	38.466 ⁴¹	53.76 ²⁵⁷	61.61 ¹⁴	89.95 ³³⁶
	124	265	85	230	22	311
Sept. 7.9	16.265	73.40	38.381	56.06	61.39	93.06
17.9	16.096 ¹⁶⁹	75.72 ²³²	38.256 ¹²⁵	58.05 ¹⁹⁹	61.11 ²⁸	95.84 ²⁷⁸
27.8	15.891 ²⁰⁵	77.66 ¹⁹⁴	38.098 ¹⁵⁸	59.69 ¹⁶⁴	60.78 ³³	98.23 ²³⁹
Oct. 7.8	15.658 ²³³	79.18 ¹⁵²	37.916 ¹⁸²	60.94 ¹²⁵	60.40 ³⁸	100.20 ¹⁹⁷
17.8	15.406 ²⁵²	80.24 ¹⁰⁶	37.717 ¹⁹⁹	61.79 ⁸⁵	60.00 ⁴⁰	101.68 ¹⁴⁸
	261	58	205	43	43	97
27.8	15.145	80.82	37.512	62.22	59.57	102.65
Nov. 6.7	14.885 ²⁶⁰	80.91 ⁹	37.308 ²⁰⁴	62.21 ¹	59.15 ⁴²	103.07 ⁴²
16.7	14.637 ²⁴⁸	80.49 ⁴²	37.115 ¹⁹³	61.76 ⁴⁵	58.73 ⁴²	102.92 ¹⁵
26.7	14.409 ²²⁸	79.56 ⁹³	36.940 ¹⁷⁵	60.87 ⁸⁹	58.33 ⁴⁰	102.20 ⁷²
Dec. 6.7	14.208 ²⁰¹	78.16 ¹⁴⁰	36.789 ¹⁵¹	59.58 ¹²⁹	57.97 ³⁶	100.93 ¹²⁷
	166	185	120	167	32	180
16.6	14.042	76.31	36.669	57.91	57.65	99.13
26.6	13.916 ¹²⁶	74.06 ²²⁵	36.584 ⁸⁵	55.92 ¹⁹⁹	57.39 ²⁶	96.86 ²²⁷
36.6	13.836 ⁸⁰	71.51 ²⁵⁵	36.536 ⁴⁸	53.66 ²²⁶	57.20 ¹⁹	94.20 ²⁶⁶
Mean Place	12.846	50.22	34.744	33.09	58.192	69.27
Secd. Tanδ	1.415	+1.002	1.202	+0.668	2.102	+1.848
α, α'	+2.0	+12.8	+2.4	+13.1	+1.2	+13.1
b, b'	+0.04	+0.8	+0.03	+0.8	+0.08	+0.8
Authority and Catalogue No.	B.J.	1281	B.J.	1284	B.J.	1288

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ε Aquarii		μ Aquarii		32 Vulpeculæ	
Mag. Spect.	3.83	A ₀	4.80	A ₃	5.24	K ₅
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₂₀ ^m ₄₄	[°] _— ['] ₉ [″] ₄₃	^h ₂₀ ^m ₄₉	[°] _— ['] ₉ [″] ₁₃	^h ₂₀ ^m ₅₁	[°] ₊ ['] ₂₇ [″] ₄₈
Jan. 1.6	09.327 ²⁸	68.08 ³⁹	08.779 ²¹	44.28 ⁴²	46.631 ¹⁷	39.03 ²¹
11.6	09.355 ⁶¹	68.47 ³³	08.800 ⁵⁷	44.70 ³³	46.614 ²⁰	36.89 ²²
21.5	09.416 ⁹³	68.80 ²⁴	08.857 ⁸⁶	45.03 ²⁶	46.634 ⁵⁷	34.64 ²²
31.5	09.509 ¹²⁵	69.04 ¹¹	08.943 ¹²¹	45.29 ¹³	46.691 ⁹⁵	32.37 ²¹
Feb. 10.5	09.634 ¹⁵⁵	69.15 ³	09.064 ¹⁵⁰	45.42 ²	46.786 ¹³³	30.18 ²⁰
20.5	09.789 ¹⁸³	69.12 ²¹	09.214 ¹⁷⁸	45.40 ¹⁹	46.919 ¹⁶⁹	28.17 ¹⁷
Mar. 2.4	09.972 ²¹⁰	68.91 ⁴¹	09.392 ²⁰⁶	45.21 ⁴¹	47.088 ²⁰⁴	26.42 ¹⁴
12.4	10.182 ²³⁵	68.50 ⁶²	09.598 ²³¹	44.80 ⁶¹	47.292 ²³⁶	25.02 ⁹
22.4	10.417 ²⁵⁸	67.88 ⁸⁴	09.829 ²⁵⁵	44.19 ⁸⁴	47.528 ²⁶⁴	24.04 ⁵
Apr. 1.3	10.675 ²⁷⁹	67.04 ¹⁰⁴	10.084 ²⁷⁷	43.35 ¹⁰⁴	47.792 ²⁹⁰	23.52 ¹
11.3	10.954 ²⁹⁵	66.00 ¹²³	10.361 ²⁹²	42.31 ¹²³	48.082 ³⁰⁸	23.49 ⁴⁷
21.3	11.249 ³⁰⁷	64.77 ¹³⁹	10.653 ³⁰⁷	41.08 ¹⁴⁰	48.390 ³²²	23.96 ⁹⁶
May 1.3	11.556 ³¹⁴	63.38 ¹⁵¹	10.960 ³¹²	39.68 ¹⁵²	48.712 ³²⁸	24.92 ¹⁴²
11.2	11.870 ³¹⁵	61.87 ¹⁵⁸	11.272 ³¹⁷	38.16 ¹⁶⁰	49.040 ³²⁷	26.34 ¹⁸²
21.2	12.185 ³⁰⁹	60.29 ¹⁶²	11.589 ³⁰⁹	36.56 ¹⁶²	49.367 ³¹⁸	28.16 ²¹⁹
31.2	12.494 ²⁹⁵	58.67 ¹⁶⁰	11.898 ²⁹⁷	34.94 ¹⁶⁵	49.685 ³⁰¹	30.35 ²⁴⁷
June 10.2	12.789 ²⁷⁵	57.07 ¹⁵⁴	12.195 ²⁷⁵	33.29 ¹⁵⁸	49.986 ²⁷⁷	32.82 ²⁷⁰
20.1	13.064 ²⁴⁹	55.53 ¹⁴³	12.470 ²⁵¹	31.71 ¹⁴⁸	50.263 ²⁴⁵	35.52 ²⁸⁵
30.1	13.313 ²¹⁴	54.10 ¹³¹	12.721 ²¹⁶	30.23 ¹³⁵	50.508 ²⁰⁹	38.37 ²⁹²
July 10.1	13.527 ¹⁷⁶	52.79 ¹¹⁴	12.937 ¹⁸²	28.88 ¹¹⁹	50.717 ¹⁶⁵	41.29 ²⁹³
20.0	13.703 ¹³³	51.65 ⁹⁷	13.119 ¹³⁷	27.69 ¹⁰¹	50.882 ¹²⁰	44.22 ²⁸⁷
30.0	13.836 ⁸⁸	50.68 ⁷⁷	13.256 ⁹¹	26.68 ⁸¹	51.002 ⁷²	47.09 ²⁷⁵
Aug. 8.9	13.924 ⁴²	49.91 ⁵⁹	13.347 ⁴⁸	25.87 ⁶²	51.074 ²⁴	49.84 ²⁵⁸
18.9	13.966 ²	49.32 ⁴⁰	13.395 ¹	25.25 ⁴⁶	51.098 ²³	52.42 ²³⁶
28.9	13.964 ⁴⁴	48.92 ²²	13.396 ⁴⁰	24.79 ²⁵	51.075 ⁶⁷	54.78 ²¹⁰
Sept. 7.9	13.920 ⁸²	48.70 ⁸	13.356 ⁷⁷	24.54 ⁸	51.008 ¹⁰⁵	56.88 ¹⁸⁰
17.9	13.838 ¹¹¹	48.62 ⁵	13.279 ¹⁰⁶	24.46 ⁴	50.903 ¹³⁶	58.68 ¹⁴⁷
27.9	13.727 ¹³⁴	48.67 ¹⁷	13.173 ¹³²	24.50 ¹⁵	50.767 ¹⁶²	60.15 ¹¹²
Oct. 7.8	13.593 ¹⁴⁸	48.84 ²⁵	13.041 ¹⁴⁶	24.65 ²³	50.605 ¹⁷⁷	61.27 ⁷⁶
17.8	13.445 ¹⁵³	49.09 ³²	12.895 ¹⁵¹	24.88 ³³	50.428 ¹⁸⁵	62.03 ³⁶
27.8	13.292 ¹⁴⁸	49.41 ³⁷	12.744 ¹⁴⁹	25.21 ³⁸	50.243 ¹⁸⁵	62.39 ²
Nov. 6.7	13.144 ¹³⁷	49.78 ⁴⁰	12.595 ¹³⁶	25.59 ⁴¹	50.058 ¹⁷⁴	62.37 ⁴³
16.7	13.007 ¹¹⁷	50.18 ⁴³	12.459 ¹¹⁸	26.00 ⁴²	49.884 ¹⁵⁹	61.94 ⁸¹
26.7	12.890 ⁹¹	50.61 ⁴⁵	12.341 ⁹³	26.42 ⁴⁷	49.725 ¹³⁶	61.13 ¹¹⁸
Dec. 6.7	12.799 ⁶³	51.06 ⁴⁵	12.248 ⁶⁶	26.89 ⁴⁶	49.589 ¹⁰⁹	59.95 ¹⁵¹
16.6	12.736 ³⁰	51.51 ⁴⁵	12.182 ³⁵	27.35 ⁴⁷	49.480 ⁷⁶	58.44 ¹⁸¹
26.6	12.706 ³	51.96 ⁴²	12.147 ¹	27.82 ⁴⁷	49.404 ⁴²	56.63 ²⁰⁴
36.6	12.709	52.38	12.146	28.29	49.362	54.59
Mean Place	09.509	65.40	08.947	41.79	47.262	34.25
Secd. Tanδ	1.015	— 0.172	1.013	— 0.162	1.131	+ 0.527
a, a'	+3.2	+13.2	+3.2	+13.5	+2.6	+13.7
b, b'	—0.01	+ 0.8	—0.01	+ 0.7	+0.02	+ 0.7
Authority and Catalogue No.	B.J.	1287	A.E.	1293	B.J.	1296

APPARENT PLACES OF STARS, 1935

503

AT UPPER TRANSIT AT GREENWICH

Name	γ Microscopii		θ Capricorni		δ^1 Cygni	
Mag. Spect.	4.7I	G5	4.19	Ao	5.57	K5
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₂₀ ^m ₅₇	[°] ₋₃₂ ['] ₃₀	^h ₂₁ ^m ₀₂	[°] ₋₁₇ ['] ₂₉	^h ₂₁ ^m ₀₃	[°] ₊₃₈ ['] ₂₅
Jan. 1.6	18.440	53.45	17.649	35.70	57.996	51.21
11.6	18.455 ¹⁵	52.53 ⁹²	17.661 ¹²	35.65 ⁵	57.955 ⁴¹	48.90 ²³¹
21.5	18.509 ⁵⁴	51.45 ¹⁰⁸	17.708 ⁴⁷	35.47 ¹⁸	57.956 ¹	46.42 ²⁴⁸
31.5	18.602 ⁹³	50.25 ¹²⁰	17.787 ⁷⁹	35.19 ²⁸	58.001 ⁴⁵	43.88 ²⁵⁴
Feb. 10.5	18.732 ¹³⁰	48.91 ¹³⁴	17.898 ¹¹¹	34.77 ⁴²	58.090 ⁸⁹	41.37 ²⁵¹
	18.896 ¹⁶⁴	47.48 ¹⁴³	18.041 ¹⁴³	34.21 ⁵⁶	58.223 ¹³³	39.02 ²³⁵
Mar. 2.4	19.096 ²⁰⁰	45.95 ¹⁵³	18.213 ¹⁷²	33.51 ⁷⁰	58.399 ¹⁷⁶	36.92 ²¹⁰
12.4	19.325 ²²⁹	44.35 ¹⁶⁰	18.414 ²⁰¹	32.64 ⁸⁷	58.617 ²¹⁸	35.18 ¹⁷⁴
22.4	19.587 ²⁶²	42.70 ¹⁶⁵	18.643 ²²⁹	31.61 ¹⁰³	58.874 ²⁵⁷	33.87 ¹³¹
Apr. 1.4	19.874 ²⁸⁷	41.03 ¹⁶⁷	18.898 ²⁵⁵	30.43 ¹¹⁸	59.165 ²⁹¹	33.05 ⁸²
	20.187 ³¹³	39.36 ¹⁶⁷	19.175 ²⁷⁷	29.11 ¹³²	59.485 ³²⁰	32.77 ²⁸
May 11.3	20.519 ³³²	37.73 ¹⁶³	19.473 ²⁹⁸	27.67 ¹⁴⁴	59.828 ³⁴³	33.04 ²⁷
21.3	20.867 ³⁴⁸	36.17 ¹⁵⁶	19.785 ³¹²	26.15 ¹⁵²	60.188 ³⁶⁰	33.86 ⁸²
May 1.3	21.226 ³⁵⁹	34.70 ¹⁴⁷	20.108 ³²³	24.58 ¹⁵⁷	60.554 ³⁶⁶	35.20 ¹³⁴
11.2	21.586 ³⁶⁰	33.39 ¹³¹	20.434 ³²⁶	23.01 ¹⁵⁷	60.920 ³⁶⁶	37.03 ¹⁸³
21.2	21.943 ³⁵⁷	32.26 ¹¹³	20.758 ³²⁴	21.50 ¹⁵¹	61.275 ³⁵⁵	39.30 ²²⁷
June 31.2	22.288 ³⁴⁵	31.33 ⁹³	21.072 ³¹⁴	20.05 ¹⁴⁵	61.612 ³³⁷	41.93 ²⁶³
10.2	22.519 ³²⁵	30.64 ⁶⁹	21.366 ²⁹⁴	18.73 ¹³²	61.922 ³¹⁰	44.86 ²⁹³
20.1	22.907 ²⁹⁴	30.22 ⁴²	21.636 ²⁷⁰	17.57 ¹¹⁶	62.196 ²⁷⁴	48.00 ³¹⁴
30.1	23.167 ²⁶⁰	30.03 ¹⁹	21.874 ²³⁸	16.59 ⁹⁸	62.430 ²³⁴	51.29 ³²⁹
July 10.1	23.382 ²¹⁵	30.12 ⁹	22.073 ¹⁹⁹	15.83 ⁷⁶	62.617 ¹⁸⁷	54.64 ³³⁵
20.1	23.550 ¹⁶⁸	30.44 ³²	22.230 ¹⁵⁷	15.27 ⁵⁶	62.754 ¹³⁷	57.98 ³³⁴
30.0	23.666 ¹¹⁶	30.96 ⁵²	22.340 ¹¹⁰	14.91 ³⁶	62.838 ⁸⁴	61.24 ³²⁶
Aug. 8.9	23.729 ⁶³	31.69 ⁷³	22.401 ⁶¹	14.76 ¹⁵	62.869 ³¹	64.35 ³¹¹
18.9	23.738 ⁹	32.55 ⁸⁶	22.417 ¹⁶	14.78 ¹⁶	62.849 ²⁰	67.25 ²⁹⁰
28.9	23.699 ³⁹	33.50 ⁹⁵	22.389 ²⁸	14.97 ¹⁹	62.781 ⁶⁸	69.90 ²⁶⁵
Sept. 7.9	23.613 ⁸⁶	34.49 ⁹⁹	22.319 ⁷⁰	15.29 ³²	62.670 ¹¹¹	72.24 ²³⁴
17.9	23.489 ¹²⁴	35.49 ¹⁰⁰	22.219 ¹⁰⁰	15.70 ⁴¹	62.524 ¹⁴⁶	74.23 ¹⁹⁹
27.9	23.337 ¹⁵²	36.39 ⁹⁰	22.090 ¹²⁹	16.14 ⁴⁴	62.349 ¹⁷⁵	75.83 ¹⁶⁰
Oct. 7.8	23.165 ¹⁷²	37.18 ⁷⁹	21.946 ¹⁴⁴	16.62 ⁴⁸	62.153 ¹⁹⁶	77.02 ¹¹⁹
17.8	22.983 ¹⁸²	37.83 ⁶⁵	21.792 ¹⁵⁴	17.10 ⁴⁸	61.947 ²⁰⁶	77.77 ⁷⁵
Nov. 27.8	22.804 ¹⁷⁹	38.28 ⁴⁵	21.639 ¹⁵³	17.55 ⁴⁵	61.739 ²⁰⁸	78.07 ³⁰
6.8	22.635 ¹⁶⁹	38.51 ²³	21.496 ¹⁴³	17.95 ⁴⁰	61.538 ²⁰¹	77.89 ¹⁸
16.7	22.485 ¹⁵⁰	38.53 ²	21.369 ¹²⁷	18.28 ³³	61.352 ¹⁸⁶	77.26 ⁶³
Dec. 26.7	22.364 ¹²¹	38.31 ²²	21.266 ¹⁰³	18.53 ²⁵	61.187 ¹⁶⁵	76.18 ¹⁰⁸
6.7	22.274 ⁹⁰	37.89 ⁴²	21.192 ⁷⁴	18.71 ¹⁸	61.050 ¹³⁷	74.69 ¹⁴⁹
16.6	22.221 ⁵³	37.26 ⁶³	21.147 ⁴⁵	18.80 ⁹	60.947 ¹⁰³	72.83 ¹⁸⁶
26.6	22.209 ¹²	36.45 ⁸¹	21.137 ¹⁰	18.79 ¹	60.880 ⁶⁷	70.66 ²¹⁷
36.6						
Mean Place	18.542	46.93	17.738	31.84	58.880	43.83
Secd, Tan δ	1.186	-0.637	1.048	-0.315	1.276	+0.793
a, a'	+3.7	+14.0	+3.4	+14.3	+2.3	+14.4
b, b'	-0.03	+0.7	-0.02	+0.7	+0.04	+0.7
Authority and Catalogue No.	A.E.	1301	A.E.	1305	A.E.	1308

No. 1308. Corrected for a parallax of 0".30

† Second transit, Aug. 8

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ζ Cygni		α Equulei		θ Microscopii	
Mag. Spect.	3.40	Ko	4.14	F8—A3	4.92	A2p
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 21 ^m 10	[°] +20 ['] 57	^h 21 ^m 12	[°] + 4 ['] 58	^h 21 ^m 16	[°] -41 ['] 04
Jan. 1.6	09.451 ³⁸	40.63 ²¹²	34.271 ⁶	42.59 ¹¹⁰	36.557 ¹⁵	75.69 ¹³
11.6	09.413 ²	38.51 ²²⁵	34.265 ²⁵	41.49 ¹¹¹	36.542 ²⁸	74.34 ¹³
21.5	09.411 ³⁵	36.26 ²³⁰	34.290 ⁵⁶	40.38 ¹⁰⁵	36.570 ⁷¹	72.78 ¹⁵
31.5	09.446 ⁷⁴	33.96 ²²⁶	34.346 ⁸⁸	39.33 ⁹⁵	36.641 ¹¹²	71.04 ¹⁷
Feb. 10.5	09.520 ¹¹³	31.70 ²¹⁰	34.434 ¹¹⁷	38.38 ⁷⁹	36.753 ¹⁵³	69.16 ¹⁸
20.5	09.633 ¹⁵¹	29.60 ¹⁸⁷	34.551 ¹⁴⁹	37.59 ⁵⁷	36.906 ¹⁹²	67.17 ¹⁹
Mar. 2.4	09.784 ¹⁸⁸	27.73 ¹⁵³	34.700 ¹⁷⁸	37.02 ³¹	37.098 ²²⁹	65.10 ²⁰
12.4	09.972 ²²³	26.20 ¹¹⁴	34.878 ²⁰⁷	36.71 ¹	37.327 ²⁶⁵	63.00 ²¹
22.4	10.195 ²⁵⁵	25.06 ⁶⁹	35.085 ²³⁴	36.70 ³¹	37.592 ²⁹⁸	60.88 ²¹
Apr. 1.4	10.450 ²⁸³	24.37 ²⁰	35.319 ²⁵⁹	37.01 ⁶⁵	37.890 ³²⁸	58.79 ²⁰
11.3	10.733 ³⁰⁷	24.17 ³¹	35.578 ²⁷⁹	37.66 ⁹⁶	38.218 ³⁵³	56.77 ¹⁹²
21.3	11.040 ³²²	24.48 ⁸¹	35.857 ²⁹⁶	38.62 ¹²⁶	38.571 ³⁷³	54.85 ¹⁷⁷
May 1.3	11.362 ³³⁵	25.29 ¹²⁸	36.153 ³⁰⁶	39.88 ¹⁵³	38.944 ³⁸⁸	53.08 ¹⁵⁸
11.2	11.697 ³³⁵	26.57 ¹⁷²	36.459 ³¹²	41.41 ¹⁷⁵	39.332 ³⁹⁵	51.50 ¹³⁶
21.2	12.032 ³²⁹	28.29 ²⁰⁹	36.771 ³⁰⁸	43.16 ¹⁹³	39.727 ³⁹⁴	50.14 ¹¹¹
31.2	12.361 ³¹⁵	30.38 ²⁴²	37.079 ²⁹⁹	45.09 ²⁰⁴	40.121 ³⁸³	49.03 ⁸¹
June 10.2	12.676 ²⁹³	32.80 ²⁶⁷	37.378 ²⁸²	47.13 ²¹¹	40.504 ³⁶³	48.22 ⁵¹
20.1	12.969 ²⁶³	35.47 ²⁸⁶	37.660 ²⁵⁶	49.24 ²¹¹	40.867 ³³⁶	47.71 ²⁰
30.1	13.232 ²²⁷	38.33 ²⁹⁶	37.916 ²²⁶	51.35 ²⁰⁷	41.203 ²⁹⁹	47.51 ¹²
July 10.1	13.459 ¹⁸⁵	41.29 ³⁰⁰	38.142 ¹⁹¹	53.42 ¹⁹⁸	41.502 ²⁵⁴	47.63 ⁴³
20.1	13.644 ¹³⁹	44.29 ²⁹⁷	38.333 ¹⁴⁹	55.40 ¹⁸⁴	41.756 ²⁰³	48.06 ⁷²
30.0	13.783 ⁹¹	47.26 ²⁸⁷	38.482 ¹⁰⁷	57.24 ¹⁶⁷	41.959 ¹⁴⁷	48.78 ⁹⁷
Aug. 9.0	13.874 ¹⁰	50.13 ²⁷²	38.589 ⁶²	58.91 ¹⁴⁹	42.106 ⁹⁰	49.75 ¹¹⁷
18.9	13.917 ⁶	52.85 ²⁵²	38.651 ¹⁸	60.40 ¹²⁷	42.196 ²⁷	50.92 ¹³²
28.9	13.911 ⁵⁰	55.37 ²²⁸	38.669 ²⁴	61.67 ¹⁰⁴	42.226 ²⁷	52.24 ¹⁴¹
Sept. 7.9	13.861 ⁹¹	57.65 ¹⁹⁸	38.645 ⁶¹	62.71 ⁸²	42.199 ⁷⁹	53.65 ¹⁴⁴
17.9	13.770 ¹²⁵	59.63 ¹⁶⁷	38.584 ⁹³	63.53 ⁶⁰	42.120 ¹²⁴	55.09 ¹³⁹
27.9	13.645 ¹⁵³	61.30 ¹³¹	38.491 ¹¹⁸	64.13 ³⁸	41.996 ¹⁶²	56.48 ¹²⁸
Oct. 7.8	13.492 ¹⁷²	62.61 ⁵⁵	38.373 ¹³⁵	64.51 ¹⁶	41.834 ¹⁸⁸	57.76 ¹¹⁰
17.8	13.320 ¹⁸³	63.56 ⁵⁵	38.238 ¹⁴⁵	64.67 ⁵	41.646 ²⁰³	58.86 ⁸⁷
27.8	13.137 ¹⁸⁵	64.11 ¹⁵	38.093 ¹⁴⁵	64.62 ²⁴	41.443 ²⁰⁸	59.73 ⁶¹
Nov. 6.8	12.952 ¹⁷⁹	64.26 ²⁵	37.948 ¹³⁹	64.38 ⁴³	41.235 ²⁰⁰	60.34 ³⁰
16.7	12.773 ¹⁶⁷	64.01 ⁶⁶	37.809 ¹²⁵	63.95 ⁶⁰	41.035 ¹⁸³	60.64 ²
26.7	12.606 ¹⁴⁷	63.35 ¹⁰⁵	37.684 ¹⁰⁶	63.35 ⁷⁶	40.852 ¹⁵⁷	60.62 ³³
Dec. 6.7	12.459 ¹²³	62.30 ¹⁴¹	37.578 ⁸³	62.59 ⁹⁰	40.695 ¹²⁵	60.29 ⁶⁵
16.6	12.336 ⁹⁴	60.89 ¹⁷³	37.495 ⁵⁶	61.69 ¹⁰⁰	40.570 ⁸⁶	59.64 ⁹³
26.6	12.242 ⁶²	59.16 ¹⁹⁹	37.439 ²⁷	60.69 ¹⁰⁸	40.484 ⁴⁶	58.71 ¹²⁰
36.6	12.180	57.17	37.412	59.61	40.438	57.51
Mean Place	10.055	34.20	34.468	41.47	36.615	67.61
Secδ, Tanδ	1.154	+ 0.576	1.004	+ 0.087	1.327	- 0.872
a, a'	+2.6	+14.8	+3.0	+14.9	+3.8	+15.2
b, b'	+0.03	+ 0.7	0.00	+ 0.7	-0.04	+ 0.7
Authority and Catalogue No.	B.J.	1314	B.J.	1318	A.N.	1323

APPARENT PLACES OF STARS, 1935

505

AT UPPER TRANSIT OF GREENWICH

Name	α Cephei			ι Capricorni			γ Pavonis		
	2-60		A5	4-30		Ko	4-30		F8
Mean Solar Date	R.A.		Dec.	R.A.		Dec.	R.A.		Dec.
	2 ^h 1 ^m 16 ^s		+62° 18'	2 ^h 1 ^m 18 ^s		-17° 06'	2 ^h 2 ^m 2 ^s		-65° 39'
Jan. 1-6	59-43	21	47-51	260	37-761	48-16	05-17	11	53-62
11-6	59-22	14	44-91	290	37-759	48-12	05-06	3	51-07
21-6	59-08	6	42-01	310	37-787	47-96	05-03	6	48-26
31-5	59-02	2	38-91	317	37-849	47-66	05-09	14	45-25
Feb. 10-5	59-04	10	35-74	311	37-943	47-25	05-23	21	42-12
20-5	59-14	19	32-63	293	38-068	46-67	05-44	30	38-94
Mar. 2-4	59-33	27	29-70	263	38-223	45-93	05-74	36	35-77
12-4	59-60	33	27-07	221	38-407	45-02	06-10	44	32-69
22-4	59-93	41	24-86	171	38-622	43-95	06-54	49	29-76
Apr. 1-4	60-34	45	23-15	116	38-864	42-70	07-03	54	27-03
11-3	60-79	50	21-99	54	39-131	41-31	07-57	59	24-56
21-3	61-29	53	21-45	8	39-421	39-80	08-16	62	22-38
May 1-3	61-82	53	21-53	70	39-727	38-21	08-78	64	20-56
11-3	62-35	54	22-23	129	40-049	36-56	09-42	65	19-12
21-2	62-89	51	23-52	184	40-374	34-91	10-07	65	18-10
31-2	63-40	49	25-36	234	40-700	33-29	10-72	63	17-51
June 10-2	63-89	43	27-70	277	41-018	31-75	11-35	59	17-37
20-1	64-32	38	30-47	312	41-319	30-33	11-94	55	17-68
30-1	64-70	32	33-59	340	41-598	29-08	12-49	49	18-41
July 10-1	65-02	24	36-99	359	41-847	28-01	12-98	40	19-57
20-1	65-26	16	40-58	369	42-060	27-15	13-38	32	21-10
30-0	65-42	9	44-27	372	42-230	26-52	13-70	22	22-94
Aug. 9-0	65-51	8	47-99	367	42-355	26-09	13-92	12	25-05
18-9	65-51	8	51-66	354	42-433	25-90	14-04	2	27-33
28-9	65-43	16	55-20	333	42-464	25-90	14-06	8	29-70
Sept. 7-9	65-27	22	58-53	306	42-450	26-07	13-98	18	32-08
17-9	65-05	28	61-59	273	42-396	26-37	13-80	26	34-37
27-9	64-77	34	64-32	234	42-307	26-79	13-54	34	36-46
Oct. 7-8	64-43	38	66-66	190	42-190	27-28	13-20	39	38-27
17-8	64-05	40	68-56	139	42-052	27-81	12-81	42	39-72
27-8	63-65	42	69-95	87	41-904	28-33	12-39	44	40-74
Nov. 6-8	63-23	42	70-82	31	41-755	28-82	11-95	44	41-27
16-7	62-81	41	71-13	27	41-611	29-28	11-51	41	41-29
26-7	62-40	39	70-86	84	41-481	29-66	11-10	37	40-79
Dec. 6-7	62-01	35	70-02	140	41-371	29-98	10-73	31	39-77
16-7	61-66	30	68-62	191	41-288	30-19	10-42	24	38-26
26-6	61-36	25	66-71	236	41-232	30-33	10-18	17	36-31
36-6	61-11		64-35		41-207	30-35	10-01		33-98
Mean Place	61-683		35-00		37-791	44-56	05-704		42-59
Secδ, Tanδ	2-152		+1-905		1-046	-0-308	2-427		-2-211
a, a'	+1-4		+15-2		+3-3	+15-3	+5-0		+15-4
b, b'	+0-10		+0-7		-0-02	+0-6	-0-11		+0-6
Authority and Catalogue No.	B.J.		1324		A.E.	1325	B.J.		1327

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ζ Capricorni		β Cephei		β Aquarii	
	3.86	G5p	3.33	Br	3.07	Go
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 21 ^m 22	[°] -22 ['] 41	^h 21 ^m 27	[°] +70 ['] 16	^h 21 ^m 28	[°] -5 ['] 51
Jan. 1.6	57.563	42.46	46.31	45.40	08.232	29.64
11.6	57.556 ⁷ / ₂₆	42.11 35	45.95 36	42.93 ²⁴⁷ / ₂₆	08.220 ¹² / ₁₇	30.17 53
21.6	57.582 ⁵⁸ / ₉₂	41.62 49	45.69 16	40.10 ²⁸³ / ₃₀₉	08.237 ⁴⁷ / ₇₇	30.65 48
31.5	57.640 ⁹² / ₁₂₄	40.98 79	45.53 4	37.01 ³²⁰ / ₃₂₁	08.284 ¹⁰⁸ / ₁₀₈	31.03 26
Feb. 10.5	57.732	40.19 93	45.49 8	33.81	08.361	31.29 ¹⁰ / ₁₀
20.5	57.856 ¹⁵⁵ / ₁₈₇	39.26 108	45.57 20	30.60 ³⁰⁷ / ₂₈₂	08.469 ¹³⁸ / ₁₆₇	31.39 9
Mar. 2.5	58.011	38.18 123	45.77 31	27.53 ²⁴⁴ / ₁₉₇	08.607 ¹⁹⁷ / ₂₂₆	31.30 31
12.4	58.198 ²¹⁷ / ₂₄₆	36.95 136	46.08 42	24.71	08.774 ¹⁹⁷ / ₂₂₆	30.99 55
22.4	58.415	35.59 148	46.50 51	22.27 ¹⁹⁷ / ₁₄₃	08.971	30.44 79
Apr. 1.4	58.661 ²⁷² / ₂₉₅	34.11 159	47.01 58	20.30	09.197 ²⁵¹ / ₂₇₄	29.65 ¹⁰³ / ₁₂₆
11.3	58.933	32.52 165	47.59 65	18.87 ⁸³ / ₂₁	09.448	28.62
21.3	59.228 ³¹⁵ / ₃₂₈	30.87 169	48.24 68	18.04	09.722 ²⁹⁴ / ₃₀₆	27.36 ¹⁴⁶ / ₁₆₃
May 1.3	59.543	29.18 168	48.92 71	17.83 ⁴¹ / ₁₀₃	10.016	25.90
11.3	59.871 ³³⁶ / ₃₃₆	27.50 164	49.63 70	18.24 ¹⁶⁰ / ₂₁₃	10.322 ³¹⁵ / ₃₁₅	24.27 ¹⁷⁵ / ₁₈₂
21.2	60.207	25.86 154	50.33 68	19.27	10.637	22.52
31.2	60.543 ³²⁹ / ₃₁₃	24.32 142	51.01 63	20.87 ²⁵⁹ / ₃₀₀	10.952 ³⁰⁸ / ₂₉₄	20.70 ¹⁸⁵ / ₁₈₁
June 10.2	60.872	22.90 124	51.64 58	23.00	11.260	18.85
20.2	61.185 ²⁸⁹ / ₂₅₉	21.66 104	52.22 50	25.59 ³³⁰ / ₃₃₀	11.554 ²⁷³ / ₂₄₃	17.04 ¹⁷⁶ / ₁₆₃
30.1	61.474 ²²³ / ₁₈₀	20.62 82	52.72 42	28.59 ³⁵⁵ / ₃₆₉	11.827 ²¹⁰ / ₁₆₉	15.28 ¹⁴⁸ / ₁₂₉
July 10.1	61.733	19.80 57	53.14 32	31.89	12.070	13.65
20.1	61.956 ¹³³ / ₈₆	19.23 34	53.46 21	35.44 ³⁷⁷ / ₃₇₇	12.280 ¹²⁷ / ₈₂	12.17 ¹¹⁰ / ₈₉
30.0	62.136	18.89 10	53.67 10	39.13	12.449	10.88
Aug. 9.0	62.269 ¹³ / ₃₇	18.79 ¹⁴ / ₁₂	53.77 ¹⁴ / ₁₁	42.90 ³⁶⁸ / ₃₅₁	12.576 ¹⁴ / ₅	09.78 ⁶⁷ / ₄₇
18.9	62.355 ¹¹ / ₅₂	18.91 ¹⁴ / ₄₈	53.77 ¹¹ / ₂₁	46.67	12.658	08.89
28.9	62.392	19.23 48	53.66 21	50.35	12.695	08.22
Sept. 7.9	62.381 ⁵² / ₉₀	19.71 60	53.45 30	53.86 ³²⁹ / ₂₉₈	12.690 ⁴⁵ / ₇₈	07.75 ²⁷ / ₁₀
17.9	62.329	20.31 68	53.15 39	57.15	12.645	07.48
27.9	62.239 ¹²⁰ / ₁₄₁	20.99 71	52.76 46	60.13 ²⁶¹ / ₂₁₈	12.567 ¹⁰⁶ / ₁₂₅	07.38 ⁶ / ₁₉
Oct. 7.9	62.119	21.70 70	52.30 52	62.74	12.461	07.44
17.8	61.978 ¹⁵⁴ / ₁₅₆	22.40 65	51.78 57	64.92 ¹⁷¹ / ₁₁₈	12.461 ¹²⁵ / ₁₃₇	07.44 ³⁰ / ₃₉
27.8	61.824	23.05 57	51.21 59	66.63 ⁶¹ / ₆₁	12.336	07.63
Nov. 6.8	61.668 ¹⁵¹ / ₁₃₇	23.62 46	50.62 61	67.81	12.199 ¹⁴¹ / ₁₃₅	07.93 ³⁹ / ₄₆
16.7	61.517	24.08 33	50.01 61	68.42 ² / ₅₇	12.058	08.32
26.7	61.380 ¹¹⁶ / ₉₂	24.41 20	49.40 58	68.44	11.923 ¹²⁵ / ₁₀₇	08.78 ⁵² / ₅₅
Dec. 6.7	61.264	24.61 ⁵ / ₁₀	48.82 54	67.87 ¹¹⁷ / ₁₇₁	11.798 ⁸⁶ / ₆₀	09.30 ⁵⁸ / ₅₈
16.7	61.172 ⁶³ / ₃₁	24.66 25	48.28 41	66.70 ¹⁷¹ / ₂₂₁	11.691	09.85
26.6	61.109	24.56 25	47.80 41	64.99	11.605	10.43
36.6	61.078	24.31	47.39	62.78	11.545	11.01
					11.512	11.58
Mean Place	57.561	37.71	49.704	30.96	08.280	28.73
Secδ, Tanδ	1.084	-0.418	2.963	+2.789	1.005	-0.103
a, a'	+3.4	+15.5	+0.8	+15.8	+3.2	+15.8
b, b'	-0.02	+0.6	+0.15	+0.6	-0.01	+0.6
Authority and Catalogue No.	B.J.	1328	B.J.	1333	B.J.	1332

APPARENT PLACES OF STARS, 1935

507

AT UPPER TRANSIT AT GREENWICH

Name	ξ Aquarii		ε Pegasi		δ Capricorni	
	4.78	A ₅	2.54	Ko	2.98	A ₅
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 21 34	^m — 8 08	^h 21 40	^m + 9 34	^h 21 43	^m — 16 25
Jan. 1.6	17.549	49.01	59.423	37.86	27.401	26.00
11.6	17.533	49.43	59.391	36.65	27.377	26.00
21.6	17.544	49.76	59.388	35.40	27.383	25.88
31.5	17.587	49.99	59.413	34.17	27.419	25.62
Feb. 10.5	17.659	50.10	59.469	33.02	27.485	25.20
20.5	17.763	50.03	59.557	32.01	27.583	24.62
Mar. 2.5	17.895	49.79	59.676	31.21	27.711	23.86
12.4	18.060	49.35	59.827	30.66	27.871	22.93
22.4	18.253	48.68	60.011	30.42	28.062	21.80
Apr. 1.4	18.475	47.77	60.225	30.51	28.283	20.51
11.4	18.723	46.64	60.467	30.95	28.532	19.04
21.3	18.996	45.30	60.735	31.74	28.808	17.45
May 1.3	19.289	43.79	61.024	32.88	29.105	15.76
11.3	19.596	42.12	61.328	34.32	29.418	14.01
21.2	19.913	40.38	61.641	36.04	29.742	12.23
31.2	20.230	38.56	61.956	37.99	30.070	10.49
June 10.2	20.544	36.74	62.265	40.10	30.393	08.82
20.2	20.840	34.99	62.560	42.32	30.705	07.27
30.1	21.117	33.30	62.835	44.61	30.997	05.88
July 10.1	21.368	31.76	63.081	46.88	31.262	04.68
20.1	21.583	30.38	63.294	49.10	31.493	03.69
30.1	21.760	29.18	63.468	51.21	31.685	02.94
Aug. 9.0	21.893	28.21	63.599	53.18	31.833	02.43
18.9	21.983	27.43	63.686	54.97	31.936	02.15
28.9	22.029	26.91	63.730	56.55	31.992	02.09
Sept. 7.9	22.028	26.57	63.730	57.91	32.002	02.23
17.9	21.989	26.42	63.692	59.03	31.971	02.54
27.9	21.916	26.41	63.620	59.90	31.903	02.98
Oct. 7.9	21.815	26.57	63.520	60.52	31.804	03.51
17.8	21.693	26.84	63.399	60.91	31.682	04.09
27.8	21.559	27.22	63.265	61.05	31.546	04.70
Nov. 6.8	21.419	27.64	63.125	60.96	31.404	05.30
16.8	21.283	28.13	62.987	60.64	31.263	05.85
26.7	21.157	28.63	62.856	60.11	31.132	06.33
Dec. 6.7	21.048	29.16	62.740	59.38	31.016	06.74
16.7	20.961	29.70	62.642	58.47	30.921	07.05
26.6	20.899	30.20	62.566	57.41	30.849	07.26
36.6	20.861	30.66	62.515	56.24	30.805	07.35
Mean Place	17.559	47.68	59.554	34.51	27.331	22.84
Secδ, Tanδ	1.010	— 0.143	1.014	+ 0.169	1.043	— 0.295
a, a'	+3.2	+16.1	+2.9	+16.5	+3.3	+16.6
b, b'	—0.01	+ 0.6	+0.01	+ 0.6	—0.02	+ 0.6
Authority and Catalogue No.	A.E.	1338	B.J.	1345	B.J.	1349

† Second transit, Aug. 18

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	γ Gruis		ι Pegasi		α Aquarii	
	3.16	B8	5.05	B3	3.19	Go
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
Mean Solar Date						
	^h 21 ^m 49	[°] -37 ['] 39	^h 21 ^m 50	[°] +25 ['] 37	^h 22 ^m 02	[°] - 0 ['] 37
Jan. 1-6	60.077 ⁴⁸	84.55 ¹⁰⁶	05.753	14.84 ¹⁷⁴	26.801	69.23 ⁷³
11-6	60.029 ¹¹	83.49 ¹³¹	05.692 ⁶¹	13.10 ¹⁸⁹	26.761 ⁴⁰	69.96 ⁶⁹
21-6	60.018 ²⁷	82.18 ¹⁵³	05.661 ³¹	11.21 ¹⁹⁷	26.746 ¹⁵	70.65 ⁶³
31-5	60.045 ⁶⁴	80.65 ¹⁷²	05.661	09.24 ¹⁹⁵	26.758 ¹²	71.28 ⁵²
Feb. 10-5	60.109 ¹⁰²	78.93 ¹⁸⁹	05.696 ⁷¹	07.29 ¹⁸⁶	26.799 ⁴¹	71.80 ³⁶
20-5	60.211 ¹⁴¹	77.04 ²⁰¹	05.767	05.43 ¹⁶⁷	26.868 ¹⁰¹	72.16 ¹⁷
Mar. 2-5	60.352 ¹⁷⁸	75.03 ²¹²	05.874 ¹⁴⁶	03.76 ¹⁴⁰	26.969 ¹³³	72.33 ⁵
12-4	60.530 ²¹⁵	72.91 ²¹⁸	06.020 ¹⁸²	02.36 ¹⁰⁷	27.102 ¹⁶⁴	72.28 ³²
22-4	60.745 ²⁵¹	70.73 ²²²	06.202 ²¹⁸	01.29 ⁶⁷	27.266 ¹⁹⁶	71.96 ⁵⁸
Apr. 1-4	60.996 ²⁸⁴	68.51 ²²⁰	06.420 ²⁵⁰	00.62 ²⁴	27.462 ²²⁷	71.38 ⁸⁶
11-4	61.280 ³¹⁵	66.31 ²¹⁵	06.670 ²⁷⁹	00.38 ²²	27.689 ²⁵⁴	70.52 ¹¹³
21-3	61.595 ³⁴¹	64.16 ²⁰⁶	06.949 ³⁰⁴	00.60 ⁶⁸	27.943 ²⁷⁸	69.39 ¹³⁹
May 1-3	61.936 ³⁶¹	62.10 ¹⁹¹	07.253 ³²⁰	01.28 ¹¹²	28.221 ²⁹⁷	68.00 ¹⁶⁰
11-3	62.297 ³⁷⁴	60.19 ¹⁷³	07.573 ³³¹	02.40 ¹⁵²	28.518 ³¹⁰	66.40 ¹⁷⁸
21-2	62.671 ³⁸⁰	58.46 ¹⁴⁹	07.904 ³³²	03.92 ¹⁹⁰	28.828 ³¹⁵	64.62 ¹⁹¹
31-2	63.051 ³⁷⁷	56.97 ¹²³	08.236 ³²⁶	05.82 ²²¹	29.143 ³¹⁴	62.71 ¹⁹⁹
June 10-2	63.428 ³⁶⁵	55.74 ⁹³	08.562 ³¹¹	08.03 ²⁴⁵	29.457 ³⁰⁵	60.72 ²⁰²
20-2	63.793 ³⁴³	54.81 ⁶¹	08.873 ²⁸⁹	10.48 ²⁶⁶	29.762 ²⁸⁶	58.70 ²⁰¹
30-1	64.136 ³¹³	54.20 ²⁸	09.162 ²⁵⁸	13.14 ²⁷⁶	30.048 ²⁶³	56.69 ¹⁹²
July 10-1	64.449 ²⁷⁴	53.92 ⁵	09.420 ²²³	15.90 ²⁸¹	30.311 ²³³	54.77 ¹⁸⁰
20-1	64.723 ²³⁰	53.97 ³⁷	09.643 ¹⁸²	18.71 ²⁸⁰	30.544 ¹⁹⁵	52.97 ¹⁶⁴
30-1	64.953 ¹⁷⁸	54.34 ⁶³	09.825 ¹³⁷	21.51 ²⁷³	30.739 ¹⁵⁶	51.33 ¹⁴⁶
Aug. 9-0	65.131 ¹²⁵	55.01 ⁹⁷	09.962 ⁹⁰	24.24 ²⁶¹	30.895 ¹¹²	49.87 ¹²⁵
19-0	65.256 ⁶⁸	55.94 ¹¹⁴	10.052 ⁴⁴	26.85 ²⁴³	31.007 ⁶⁸	48.62 ¹⁰²
28-9	65.324 ¹⁴	57.08 ¹³¹	10.096 ¹	29.28 ²²¹	31.075 ²⁶	47.60 ⁸⁰
Sept. 7-9	65.338 ³⁹	58.39 ¹³⁹	10.095 ⁴²	31.49 ¹⁹⁶	31.101 ¹⁴	46.80 ⁵⁹
17-9	65.299 ⁸⁴	59.78 ¹⁴²	10.053 ⁷⁹	33.45 ¹⁶⁸	31.087 ⁵⁰	46.21 ³⁷
27-9	65.215 ¹²⁵	61.20 ¹²⁷	09.974 ¹¹⁰	35.13 ¹³⁷	31.037 ⁸⁰	45.84 ¹⁷
Oct. 7-9	65.090 ¹⁵⁴	62.58 ¹¹⁰	09.864 ¹³³	36.50 ¹⁰⁵	30.957 ¹⁰³	45.67 ¹⁶
17-8	64.936 ¹⁷⁶	63.85 ⁸⁸	09.731 ¹⁴⁹	37.55 ⁷⁰	30.854 ¹¹⁹	45.83 ³¹
27-8	64.760 ¹⁸⁶	64.95 ⁶¹	09.582 ¹⁵⁸	38.25 ³⁴	30.735 ¹²⁸	46.14 ⁴²
Nov. 6-8	64.574 ¹⁸⁶	65.83 ³²	09.424 ¹⁶⁰	38.59 ³⁸	30.607 ¹²⁵	47.09 ⁶¹
16-8	64.388 ¹⁷⁸	66.44 ²⁹	09.264 ¹⁵⁴	38.57 ¹⁰⁶	30.478 ⁹⁹	48.39 ⁷²
26-7	64.210 ¹⁶⁰	66.76 ⁶⁰	09.110 ¹⁴³	38.19 ¹³⁷	30.353 ⁸⁰	49.11 ⁷⁴
Dec. 6-7	64.050 ¹³⁶	66.78 ⁶⁰	08.967 ¹²⁶	37.46 ¹⁶¹	30.239 ⁵⁷	49.85
16-7	63.914 ¹⁰⁷	66.49 ⁸⁸	08.841 ¹⁰⁵	36.40 ¹³⁷	30.140 ⁸⁰	
26-6	63.807 ⁷³	65.89 ⁸⁸	08.736 ⁸¹	35.03 ¹⁶¹	30.060 ⁵⁷	
36-6	63.734	65.01	08.655	33.42	30.003	
Mean Place	59.960	76.75	06.072	06.96	26.739	70.59
Secd, Tanδ	1.263	- 0.772	1.109	+ 0.480	1.000	- 0.011
a, a'	+3.6	+16.9	+2.7	+16.9	+3.1	+17.5
b, b'	-0.04	+ 0.5	+0.03	+ 0.5	0.00	+ 0.5
Authority and Catalogue No.	B.J.	1356	B.J.	1357	B.J.	1370

APPARENT PLACES OF STARS, 1935

509

AT UPPER TRANSIT AT GREENWICH

Name	α Pegasi		α Gruis		ζ Cephei	
	3·96	F5	2·16	B5	3·62	K0
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 22 ^m 03	[°] +25 ['] 01	^h 22 ^m 04	[°] -47 ['] 16	^h 22 ^m 08	[°] +57 ['] 52
Jan. 1·6	58·684 ⁶⁹	45·71 ¹⁶³	08·893 ⁸⁸	44·90 ¹⁴⁵	34·368 ²²⁵	66·03 ²⁰⁹
11·6	58·615 ⁴¹	44·08 ¹⁷⁹	08·805 ⁴⁵	43·45 ¹⁷⁶	34·143 ¹⁷⁵	63·94 ²⁴⁷
21·6	58·574 ¹¹	42·29 ¹⁸⁸	08·760 ²	41·69 ²⁰³	33·968 ¹²⁰	61·47 ²⁷⁴
31·6	58·563 ²²	40·41 ¹⁸⁹	08·758 ⁴²	39·66 ²²⁵	33·848 ⁵⁵	58·73 ²⁹³
Feb. 10·5	58·585 ⁵⁷	38·52 ¹⁷⁹	08·800 ⁸⁸	37·41 ²⁴²	33·793 ¹³	55·80 ²⁹⁷
20·5	58·642 ⁹⁴	36·73 ¹⁶³	08·888 ¹³³	34·99 ²⁵⁵	33·806 ⁸⁵	52·83 ²⁹¹
Mar. 2·5	58·736 ¹³¹	35·10 ¹³⁸	09·021 ¹⁷⁸	32·44 ²⁶⁴	33·891 ¹⁵⁷	49·92 ²⁷²
12·4	58·867 ¹⁶⁹	33·72 ¹⁰⁶	09·199 ²²³	29·80 ²⁶⁶	34·048 ²²⁷	47·20 ²⁴¹
22·4	59·036 ²⁰⁶	32·66 ⁶⁹	09·422 ²⁶⁴	27·14 ²⁶⁴	34·275 ²⁹⁵	44·79 ²⁰⁰
Apr. 1·4	59·242 ²⁴⁰	31·97 ²⁷	09·686 ³⁰⁵	24·50 ²⁵⁶	34·570 ³⁵⁴	42·79 ¹⁵²
11·4	59·482 ²⁷¹	31·70 ¹⁷	09·991 ³⁴²	21·94 ²⁴⁵	34·924 ⁴⁰⁵	41·27 ⁹⁸
21·3	59·753 ²⁹⁷	31·87 ⁶²	10·333 ³⁷⁴	19·49 ²²⁷	35·329 ⁴⁴⁶	40·29 ⁴⁰
May 1·3	60·050 ³¹⁷	32·49 ¹⁰⁵	10·707 ³⁹⁹	17·22 ²⁰⁶	35·775 ⁴⁷³	39·89 ¹⁹
11·3	60·367 ³²⁹	33·54 ¹⁴⁶	11·106 ⁴¹⁷	15·16 ¹⁷⁹	36·248 ⁴⁸⁹	40·08 ⁷⁸
21·3	60·696 ³³³	35·00 ¹⁸²	11·523 ⁴²⁶	13·37 ¹⁴⁷	36·737 ⁴⁹⁰	40·86 ¹³⁴
31·2	61·029 ³³⁰	36·82 ²¹⁴	11·949 ⁴²⁶	11·90 ¹¹³	37·227 ⁴⁷⁹	42·20 ¹⁸⁶
June 10·2	61·359 ³¹⁸	38·96 ²³⁹	12·375 ⁴¹⁵	10·77 ⁷⁶	37·706 ⁴⁵³	44·06 ²³⁴
20·2	61·677 ²⁹⁷	41·35 ²⁵⁸	12·790 ³⁹³	10·01 ³⁸	38·159 ⁴¹⁷	46·40 ²⁷⁴
30·1	61·974 ²⁶⁹	43·93 ²⁷²	13·183 ³⁶²	09·63 ³	38·576 ³⁶⁹	49·14 ³⁰⁷
July 10·1	62·243 ²³⁵	46·65 ²⁷⁷	13·545 ³²¹	09·66 ⁴¹	38·945 ³¹⁴	52·21 ³³³
20·1	62·478 ¹⁹⁶	49·42 ²⁷⁷	13·866 ²⁷²	10·07 ⁷⁸	39·259 ²⁵²	55·54 ³⁵²
30·1	62·674 ¹⁵³	52·19 ²⁷⁰	14·138 ²¹⁵	10·85 ¹¹²	39·511 ¹⁸⁴	59·06 ³⁶²
Aug. 9·0	62·827 ¹⁰⁷	54·89 ²⁵⁹	14·353 ¹⁵⁴	11·97 ¹⁴⁰	39·695 ¹¹⁴	62·68 ³⁶⁵
19·0	62·934 ⁶¹	57·48 ²⁴³	14·507 ⁹⁰	13·37 ¹⁶³	39·809 ²⁴	66·33 ³⁶⁰
28·9	62·995 ¹⁶	59·91 ²²²	14·597 ²⁷	15·00 ¹⁷⁸	39·852 ²⁵	69·93 ³⁴⁸
Sept. 7·9	63·011 ²⁶	62·13 ¹⁹⁸	14·624 ³⁵	16·78 ¹⁸⁷	39·827 ⁹⁰	73·41 ³²⁹
17·9	62·985 ⁶³	64·11 ¹⁷⁰	14·589 ⁹⁰	18·65 ¹⁸⁶	39·737 ¹⁵⁰	76·70 ³⁰²
27·9	62·922 ⁹⁵	65·81 ¹⁴¹	14·499 ¹⁴⁰	20·51 ¹⁷⁹	39·587 ²⁰²	79·72 ²⁷¹
Oct. 7·9	62·827 ¹²¹	67·22 ¹⁰⁸	14·359 ¹⁷⁸	22·30 ¹⁶¹	39·385 ²⁴⁷	82·43 ²³³
17·8	62·706 ¹³⁸	68·30 ⁷⁶	14·181 ²⁰⁸	23·91 ¹³⁸	39·138 ²⁸³	84·76 ¹⁸⁹
27·8	62·568 ¹⁴⁹	69·06 ⁴¹	13·973 ²²³	25·29 ¹⁰⁷	38·855 ³⁰⁸	86·65 ¹⁴¹
Nov. 6·8	62·419 ¹⁵⁴	69·47 ⁶	13·750 ²³⁰	26·36 ⁷³	38·547 ³²⁵	88·06 ⁸⁹
16·8	62·265 ¹⁵⁰	69·53 ²⁹	13·520 ²²⁴	27·09 ³⁴	38·222 ³³⁰	88·95 ³⁴
26·7	62·115 ¹⁴¹	69·24 ⁶⁴	13·296 ²⁰⁸	27·43 ⁶	37·892 ³²⁵	89·29 ²²
Dec. 6·7	61·974 ¹²⁷	68·60 ⁹⁶	13·088 ¹⁸⁴	27·37 ⁴⁶	37·567 ³¹¹	89·07 ⁷⁸
16·7	61·847 ¹⁰⁹	67·64 ¹²⁶	12·904 ¹⁵³	26·91 ⁸⁶	37·256 ²⁸⁶	88·29 ¹³³
26·7	61·738 ⁸⁷	66·38 ¹⁵²	12·751 ¹¹⁶	26·05 ¹²²	36·970 ²⁵²	86·96 ¹⁸¹
36·6	61·651	64·86	12·635	24·83	36·718	85·15
Mean Place	58·918	37·26	08·742	35·20	35·718	49·87
Sec δ, Tan δ	1·104	+ 0·467	1·474	- 1·083	1·881	+ 1·593
a, a'	+2·8	+17·5	+3·8	+17·5	+2·1	+17·7
b, b'	+0·03	+ 0·5	-0·06	+ 0·5	+0·09	+ 0·5
Authority and Catalogue No.	A.N.	1375	B.J.	1374	B.J.	1381

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	θ Aquarii		α Tucanæ		γ Aquarii	
Mag. Spect.	4.32	Ko	2.91	K2	3.97	Ao
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 22 13	^s 06	^h ^m 22 14	^s 34	^h ^m 22 18	^s 42
Jan. 1-6	24.445 ⁴⁶	27.70 ⁴⁰	04.03 ¹⁷	75.24 ¹⁹⁷	18.097 ⁵⁰	53.94 ⁶⁶
11-6	24.399	28.10 ³¹	03.86 ¹²	73.27 ²³⁴	18.047 ²⁷	54.60 ⁶²
21-6	24.378 ⁵	28.41 ¹⁹	03.74 ⁵	70.93 ²⁶⁴	18.020 ²	55.22 ⁵⁵
31-6	24.383 ³²	28.60 ¹¹	03.69 ¹	68.29 ²⁸⁹	18.018 ²⁵	55.77 ⁴²
Feb. 10-5	24.415 ⁶¹	28.65 ¹¹	03.70 ⁷	65.40 ³⁰⁶	18.043 ⁵⁵	56.19 ²⁸
20-5	24.476 ⁹³	28.54 ³⁰	03.77 ¹⁴	62.34 ³¹⁶	18.098 ⁸⁵	56.47 ⁸
Mar. 2-5	24.569 ¹²⁴	28.24 ⁵²	03.91 ²⁰	59.18 ³²¹	18.183 ¹¹⁷	56.55 ¹⁴
12-5	24.693 ¹⁵⁷	27.72 ⁷⁴	04.11 ²⁷	55.97 ³¹⁷	18.300 ¹⁵⁰	56.41 ³⁸
22-4	24.850 ¹⁸⁹	26.98 ⁹⁸	04.38 ³²	52.80 ³⁰⁹	18.450 ¹⁸³	56.03 ⁶⁵
Apr. 1-4	25.039 ²²⁰	26.00 ¹²⁰	04.70 ³⁸	49.71 ²⁹⁵	18.633 ²¹⁵	55.38 ⁹²
11-4	25.259 ²⁴⁹	24.80 ¹⁴²	05.08 ⁴³	46.76 ²⁷²	18.848 ²⁴⁵	54.46 ¹¹⁷
21-3	25.508 ²⁷⁵	23.38 ¹⁶⁰	05.51 ⁴⁷	44.04 ²⁴⁶	19.093 ²⁷⁰	53.29 ¹⁴²
May 1-3	25.783 ²⁹⁶	21.78 ¹⁷⁴	05.98 ⁵¹	41.58 ²¹⁴	19.363 ²⁹²	51.87 ¹⁶³
11-3	26.079 ³¹¹	20.04 ¹⁸⁶	06.49 ⁵³	39.44 ¹⁷⁷	19.655 ³⁰⁷	50.24 ¹⁸⁰
21-3	26.390 ³¹⁹	18.18 ¹⁹²	07.02 ⁵⁵	37.67 ¹³⁷	19.962 ³¹⁶	48.44 ¹⁹³
31-2	26.709 ³¹⁹	16.26 ¹⁹³	07.57 ⁵⁵	36.30 ⁹³	20.278 ³¹⁷	46.51 ²⁰⁰
June 10-2	27.028 ³¹²	14.33 ¹⁸⁸	08.12 ⁵⁴	35.37 ⁴⁷	20.595 ³¹⁰	44.51 ²⁰²
20-2	27.340 ²⁹⁸	12.45 ¹⁸¹	08.66 ⁵²	34.90 ¹	20.905 ²⁹⁵	42.49 ²⁰⁰
30-2	27.638 ²⁷⁴	10.64 ¹⁶⁶	09.18 ⁴⁷	34.89 ⁴⁶	21.200 ²⁷³	40.49 ¹⁹⁰
July 10-1	27.912 ²⁴⁵	08.98 ¹⁴⁹	09.65 ⁴²	35.35 ⁸⁹	21.473 ²⁴⁴	38.59 ¹⁷⁸
20-1	28.157 ²⁰⁹	07.49 ¹²⁹	10.07 ³⁶	36.24 ¹³¹	21.717 ²⁰⁹	36.81 ¹⁶²
30-1	28.366 ¹⁶⁹	06.20 ¹⁰⁷	10.43 ²⁹	37.55 ¹⁶⁷	21.926 ¹⁷⁰	35.19 ¹⁴³
Aug. 9-0	28.535 ¹²⁶	05.13 ⁸³	10.72 ²⁰	39.22 ¹⁹⁷	22.096 ¹²⁸	33.76 ¹²¹
19-0	28.661 ⁸²	04.30 ⁶⁰	10.92 ¹²	41.19 ²²⁰	22.224 ⁸⁵	32.55 ⁹⁸
28-9	28.743 ³⁸	03.70 ³⁷	11.04 ³	43.39 ²³⁴	22.309 ⁴²	31.57 ⁷⁶
Sept. 7-9	28.781 ²	03.33 ¹⁶	11.07 ⁵	45.73 ²³⁸	22.351 ¹	30.81 ⁵³
17-9	28.779 ⁴⁰	03.17 ³	11.02 ¹³	48.11 ²³⁴	22.352 ³⁵	30.28 ³²
27-9	28.739 ⁷²	03.20 ²⁰	10.89 ²⁰	50.45 ²¹⁹	22.317 ⁶⁷	29.96 ¹²
Oct. 7-9	28.667 ⁹⁶	03.40 ³³	10.69 ²⁶	52.64 ¹⁹⁵	22.250 ⁹¹	29.84 ⁵
17-9	28.571 ¹¹⁵	03.73 ⁴³	10.43 ³¹	54.59 ¹⁶³	22.159 ¹¹⁰	29.89 ²¹
27-8	28.456 ¹²⁵	04.16 ⁵⁰	10.12 ³³	56.22 ¹²²	22.049 ¹²¹	30.10 ³³
Nov. 6-8	28.331 ¹²⁸	04.66 ⁵⁵	09.79 ³⁵	57.44 ⁷⁷	21.928 ¹²⁵	30.43 ⁴⁵
16-8	28.203 ¹²⁵	05.21 ⁵⁷	09.44 ³⁵	58.21 ²⁷	21.803 ¹²²	30.88 ⁵³
26-7	28.078 ¹¹⁶	05.78 ⁵⁷	09.09 ³³	58.48 ²⁴	21.681 ¹¹⁵	31.41 ⁶¹
Dec. 6-7	27.962 ¹⁰²	06.35 ⁵⁵	08.76 ³⁰	58.24 ⁷⁵	21.566 ¹⁰²	32.02 ⁶⁵
16-7	27.860 ⁸⁴	06.90 ⁵¹	08.46 ²⁷	57.49 ¹²⁴	21.464 ⁸⁷	32.67 ⁶⁸
26-7	27.776 ⁶³	07.41 ⁴⁶	08.19 ²¹	56.25 ¹⁶⁹	21.377 ⁶⁶	33.35 ⁶⁹
36-6	27.713	07.87	07.98	54.56	21.311	34.04
Mean Place	24.282	27.24	03.973	63.46	17.952	55.44
Sec δ , Tan δ	1.010	-0.142	2.036	-1.774	1.000	-0.030
a, a'	+3.2	+17.9	+4.1	+17.9	+3.1	+18.1
b, b'	-0.01	+0.4	-0.11	+0.4	0.00	+0.4
Authority and Catalogue No.	B.J.	1386	B.J.	1387	B.J.	1391

APPARENT PLACES OF STARS, 1935

511

AT UPPER TRANSIT AT GREENWICH

Name	σ Aquarii		η Aquarii		κ Aquarii	
Mag. Spect.	4.89	Ao	4.13	B8	5.33	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 22 27	[°] ['] — 11 00	^h ^m 22 32	[°] ['] — 0 26	^h ^m 22 34	[°] ['] — 4 33
Jan. 1.7	12.763	41.13	01.173	68.57	23.680	48.75
11.6	12.704	41.42	01.113	69.27	23.620	49.29
21.6	12.672	41.59	01.075	69.93	23.581	49.77
31.6	12.664	41.61	01.061	70.52	23.565	50.14
Feb. 10.6	12.683	41.46	01.072	71.01	23.576	50.38
20.5	12.732	41.15	01.112	71.34	23.615	50.47
Mar. 2.5	12.809	40.66	01.183	71.49	23.684	50.35
12.5	12.921	39.94	01.286	71.42	23.785	50.03
22.4	13.066	39.00	01.423	71.10	23.921	49.47
Apr. 1.4	13.242	37.85	01.593	70.52	24.089	48.66
11.4	13.455	36.49	01.797	69.66	24.291	47.60
21.4	13.694	34.93	02.032	68.53	24.524	46.30
May 1.3	13.963	33.24	02.295	67.15	24.786	44.79
11.3	14.256	31.39	02.581	65.55	25.071	43.09
21.3	14.565	29.48	02.885	63.76	25.375	41.24
31.3	14.882	27.52	03.199	61.83	25.689	39.30
June 10.2	15.203	25.60	03.517	59.82	26.008	37.30
20.2	15.521	23.73	03.830	57.76	26.322	35.31
30.2	15.827	21.99	04.130	55.73	26.624	33.37
July 10.1	16.111	20.39	04.410	53.76	26.907	31.53
20.1	16.366	19.00	04.663	51.91	27.163	29.84
30.1	16.588	17.82	04.882	50.21	27.386	28.33
Aug. 9.1	16.770	16.89	05.063	48.70	27.571	27.03
19.0	16.911	16.17	05.204	47.40	27.714	25.95
29.0	17.006†	15.74	05.301	46.33	27.816	25.12
Sept. 7.9	17.059	15.54	05.356	45.49	27.874	24.53
17.9	17.069	15.54	05.370	44.88	27.891	24.16
27.9	17.041	15.74	05.347	44.49	27.870	24.00
Oct. 7.9	16.981	16.11	05.293	44.30	27.818	24.04
17.9	16.892	16.58	05.212	44.30	27.737	24.23
27.8	16.786	17.15	05.111	44.46	27.636	24.56
Nov. 6.8	16.665	17.76	04.997	44.77	27.522	25.00
16.8	16.538	18.39	04.877	45.19	27.402	25.52
26.8	16.413	19.01	04.756	45.72	27.281	26.10
Dec. 6.7	16.294	19.59	04.641	46.32	27.165	26.71
16.7	16.188	20.09	04.536	46.99	27.058	27.33
26.7	16.096	20.52	04.444	47.69	26.966	27.95
36.7	16.025	20.90	04.370	48.41	26.891	28.53
Mean Place	12.516	40.12	00.969	70.83	23.437	49.81
Secδ, Tanδ	1.019	— 0.195	1.000	— 0.008	1.003	— 0.080
a, a'	+3.2	+18.4	+3.1	+18.6	+3.1	+18.7
b, b'	— 0.01	+ 0.4	0.00	+ 0.4	0.00	+ 0.4
Authority and Catalogue No.	A.E.	1404	B.J.	1409	N.A.	1410

† First transit, Aug. 29

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ζ Pegasi		β Gruis		η Pegasi	
	3.61	B8	2.24	Mb	3.10	G0
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 22 ^m 38	+10° 29'	^h 22 ^m 38	-47° 13'	^h 22 ^m 39	+29° 52'
Jan. 1.7	13.255 71	35.69 105	48.083 128	40.05 122	56.973 103	62.77 152
11.6	13.184 49	34.64 110	47.955 91	38.83 159	56.870 80	61.25 174
21.6	13.135 26	33.54 112	47.864 53	37.24 191	56.790 53	59.51 189
31.6	13.109 —	32.42 107	47.811 —	35.33 220	56.737 21	57.62 197
Feb. 10.6	13.109 30	31.35 97	47.800 31	33.13 242	56.716 14	55.65 195
20.5	13.139 61	30.38 80	47.831 77	30.71 260	56.730 52	53.70 185
Mar. 2.5	13.200 95	29.58 58	47.908 123	28.11 274	56.782 93	51.85 165
12.5	13.295 130	29.00 32	48.031 169	25.37 282	56.875 135	50.20 139
22.4	13.425 166	28.68 —	48.200 215	22.55 285	57.010 177	48.81 104
Apr. 1.4	13.591 201	28.67 31	48.415 260	19.70 282	57.187 217	47.77 64
11.4	13.792 234	28.98 65	48.675 302	16.88 274	57.404 256	47.13 21
21.4	14.026 263	29.63 98	48.977 340	14.14 259	57.660 288	46.92 25
May 1.3	14.289 288	30.61 130	49.317 373	11.55 239	57.948 315	47.17 70
11.3	14.577 306	31.91 159	49.690 399	09.16 215	58.263 334	47.87 113
21.3	14.883 317	33.50 183	50.089 415	07.01 184	58.597 344	49.00 155
31.3	15.200 321	35.33 203	50.504 424	05.17 150	58.941 347	50.55 191
June 10.2	15.521 315	37.36 217	50.928 420	03.67 113	59.288 341	52.46 223
20.2	15.836 304	39.53 226	51.348 408	02.54 71	59.629 324	54.69 248
30.2	16.140 282	41.79 228	51.756 383	01.83 30	59.953 301	57.17 267
July 10.1	16.422 256	44.07 226	52.139 349	01.53 12	60.254 270	59.84 280
20.1	16.678 222	46.33 218	52.488 305	01.65 54	60.524 233	62.64 285
30.1	16.900 184	48.51 205	52.793 254	02.19 92	60.757 192	65.49 286
Aug. 9.1	17.084 144	50.56 190	53.047 197	03.11 127	60.949 147	68.35 279
19.0	17.228 100	52.46 170	53.244 136	04.38 156	61.096 100	71.14 268
29.0	17.328 59	54.16 149	53.380 72	05.94 178	61.196 54	73.82 251
Sept. 7.9	17.387 18	55.65 126	53.452 12	07.72 194	61.250 11	76.33 230
17.9	17.405 19	56.91 102	53.464 48	09.66 200	61.261 30	78.63 206
27.9	17.386 51	57.93 77	53.416 100	11.66 197	61.231 65	80.69 177
Oct. 7.9	17.335 79	58.70 53	53.316 145	13.63 187	61.166 95	82.46 147
17.9	17.256 98	59.23 30	53.171 181	15.50 167	61.071 118	83.93 114
27.8	17.158 113	59.53 7	52.990 204	17.17 141	60.953 137	85.07 78
Nov. 6.8	17.045 121	59.60 15	52.786 220	18.58 108	60.816 147	85.85 42
16.8	16.924 123	59.45 36	52.566 223	19.66 70	60.669 152	86.27 4
26.8	16.801 119	59.09 55	52.343 217	20.36 30	60.517 150	86.31 34
Dec. 6.7	16.682 111	58.54 73	52.126 202	20.66 13	60.367 145	85.97 70
16.7	16.571 100	57.81 88	51.924 180	20.53 56	60.222 133	85.27 105
26.7	16.471 84	56.93 100	51.744 151	19.97 96	60.089 117	84.22 135
36.7	16.387 —	55.93 —	51.593 —	19.01 —	59.972 —	82.87 —
Mean Place	13.111	29.89	47.720	30.08	57.071	51.12
Secδ, Tanδ	1.017	+0.185	1.473	-1.081	1.153	+0.575
a, a'	+3.0	+18.8	+3.6	+18.8	+2.8	+18.8
b, b'	+0.01	+0.3	-0.07	+0.3	+0.04	+0.3
Authority and Catalogue No.	B.J.	1415	B.J.	1416	B.J.	1418

APPARENT PLACES OF STARS, 1935

513

AT UPPER TRANSIT AT GREENWICH

Name	ε Gruis		μ Pegasi		ι Cephei	
	3·69	A2	3·67	Ko	3·68	Ko
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 22 44	[°] ['] -51 39	^h ^m 22 46	[°] ['] +24 15	^h ^m 22 47	[°] ['] +65 51
Jan. 1·7	38·706	43·48	51·779	39·04	20·10	50·13
11·6	38·551 ¹⁵⁵	42·12 ¹³⁶	51·685 ⁹⁴	37·68 ¹³⁶	19·73 ³⁷	48·51 ¹⁶²
21·6	38·434 ¹¹⁷	40·37 ¹⁷⁵	51·613 ⁷²	36·14 ¹⁵⁴	19·41 ³²	46·40 ²¹¹
31·6	38·359 ⁷⁵	38·27 ²¹⁰	51·565 ⁴⁸	34·49 ¹⁶⁵	19·15 ²⁶	43·90 ²⁵⁰
Feb. 10·6	38·330 ²⁹	35·88 ²³⁹	51·545 ²⁰	32·79 ¹⁷⁰	18·97 ¹⁸	41·11 ²⁷⁹
		264	12	167	10	298
20·5	38·348	33·24	51·557	31·12	18·87	38·13
Mar. 2·5	38·416	30·42	51·605	29·58	18·87	35·09
12·5	38·535 ¹¹⁹	27·48 ²⁹⁴	51·691 ⁸⁶	28·22 ¹⁵⁴	18·97 ¹⁰	32·13 ³⁰⁴
22·5	38·704 ¹⁶⁹	24·46 ³⁰²	51·816 ¹²⁵	27·12 ¹¹⁰	19·16 ¹⁹	29·36 ²⁷⁷
Apr. 1·4	38·924 ²²⁰	21·44 ³⁰²	51·981 ¹⁶⁵	26·35 ⁷⁷	19·44 ²⁸	26·89 ²⁴⁷
		269	204	40	38	206
11·4	39·193	18·45	52·185	25·95	19·82	24·83
21·4	39·508 ³¹⁵	15·59 ²⁸⁶	52·426 ²⁴¹	25·96 ¹	20·27 ⁴⁵	23·25 ¹⁵⁸
May 1·3	39·867 ³⁵⁹	12·89 ²⁷⁰	52·699 ²⁷³	26·38 ⁴²	20·79 ⁵²	22·20 ¹⁰⁵
11·3	40·260 ³⁹³	10·42 ²⁴⁷	52·999 ³⁰⁰	27·21 ⁸³	21·36 ⁵⁷	21·73 ⁴⁷
21·3	40·684 ⁴²⁴	08·23 ²¹⁹	53·320 ³²¹	28·44 ¹²³	21·96 ⁶⁰	21·86 ¹³
		442	332	160	61	71
31·3	41·126	06·38	53·652	30·04	22·57	22·57
June 10·2	41·578 ⁴⁵²	04·89 ¹⁴⁹	53·989 ³³⁷	31·96 ¹⁹²	23·18 ⁶¹	23·84 ¹²⁷
20·2	42·029 ⁴⁵¹	03·82 ¹⁰⁷	54·321 ³³²	34·15 ²¹⁹	23·78 ⁶⁰	25·64 ¹⁸⁰
30·2	42·468 ⁴³⁹	03·19 ⁶³	54·640 ³¹⁹	36·55 ²⁴⁰	24·34 ⁵⁶	27·93 ²²⁹
July 10·2	42·881 ⁴¹³	03·00 ¹⁹	54·938 ²⁹⁸	39·10 ²⁵⁵	24·85 ⁵¹	30·64 ²⁷¹
		378	269	264	45	306
20·1	43·259	03·25	55·207	41·74	25·30	33·70
30·1	43·591 ³³²	03·94 ⁶⁹	55·442 ²³⁵	44·41 ²⁶⁷	25·68 ³⁸	37·04 ³³⁴
Aug. 9·1	43·869 ²⁷⁸	05·03 ¹⁰⁹	55·637 ¹⁹⁵	47·04 ²⁶³	25·98 ³⁰	40·58 ³⁵⁴
19·0	44·086 ²¹⁷	06·48 ¹⁴⁵	55·790 ¹⁵³	49·59 ²⁵⁵	26·20 ²²	44·26 ³⁶⁸
29·0	44·237 ¹⁵¹	08·24 ¹⁷⁶	55·899 ¹⁰⁹	52·01 ²⁴²	26·34 ¹⁴	47·99 ³⁷³
		82	65	224	5	371
Sept. 7·9	44·319	10·22	55·964	54·25	26·39	51·70
17·9	44·335 ¹⁶	12·35 ²¹³	55·987 ²³	56·28 ²⁰³	26·35 ⁴	55·32 ³⁶²
27·9	44·286 ⁴⁹	14·54 ²¹⁹	55·970 ¹⁷	58·06 ¹⁷⁸	26·23 ¹²	58·76 ³⁴⁴
Oct. 7·9	44·178 ¹⁰⁸	16·68 ²¹⁴	55·919 ⁵¹	59·58 ¹⁵²	26·04 ¹⁹	61·95 ³¹⁹
17·9	44·020 ¹⁵⁸	18·71 ²⁰³	55·838 ⁸¹	60·81 ¹²³	25·78 ²⁶	64·84 ²⁸⁹
		200	104	92	31	250
27·9	43·820	20·52	55·734	61·73	25·47	67·34
Nov. 6·8	43·591 ²²⁹	22·03 ¹⁵¹	55·613 ¹²¹	62·34 ⁶¹	25·11 ³⁶	69·40 ²⁰⁶
16·8	43·344 ²⁴⁷	23·18 ¹¹⁵	55·481 ¹³²	62·62 ²⁸	24·71 ⁴⁰	70·97 ¹⁵⁷
26·8	43·091 ²⁵³	23·92 ⁷⁴	55·345 ¹³⁶	62·58 ⁴	24·28 ⁴³	71·99 ¹⁰²
Dec. 6·7	42·842 ²⁴⁹	24·21 ²⁹	55·208 ¹³⁷	62·21 ³⁷	23·85 ⁴³	72·44 ⁴⁵
		234	131	68	44	14
16·7	42·608	24·04	55·077	61·53	23·41	72·30
26·7	42·396 ²¹²	23·41 ⁶³	54·956 ¹²¹	60·56 ⁹⁷	22·98 ⁴³	71·56 ⁷⁴
36·7	42·215 ¹⁸¹	22·32 ¹⁰⁹	54·849 ¹⁰⁷	59·32 ¹²⁴	22·58 ⁴⁰	70·26 ¹³⁰
Mean Place	38·322	32·66	51·747	28·73	21·631	29·96
Secδ, Tanδ	1·612	-1·264	1·097	+0·451	2·445	+2·231
α, α'	+3·6	+19·0	+2·9	+19·0	+2·1	+19·0
δ, δ'	-0·08	+0·3	+0·03	+0·3	+0·14	+0·3
Authority and Catalogue No.	B.J.	1421	A.N.	1423	B.J.	1424

(330/3544)

(NAUTICAL ALMANAC, 1935)

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APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	λ Aquarii		δ Aquarii		α Piscis Australis (Fomalhaut)	
	3·84	Ma	3·51	A ₂	1·29	A ₃
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
Mean Solar Date						
	^h ^m 22 49	[°] ['] — 7 55	^h ^m 22 51	[°] ['] — 16 09	^h ^m 22 54	[°] ['] — 29 57
Jan. 1·7	13·771 ⁶⁹	32·78 ⁴²	12·556 ⁷⁴	63·03 ¹¹	04·228 ⁹²	67·61 ⁴¹
11·6	13·702 ⁴⁹	33·20 ³¹	12·482 ⁵⁴	63·14 ⁶	04·136 ⁶⁸	67·20 ⁶⁹
21·6	13·653 ²⁸	33·51 ¹⁸	12·428 ³⁰	63·08 ²⁵	04·068 ⁴¹	66·51 ⁹⁷
31·6	13·625 ³	33·69 ⁴	12·398 ⁵	62·83 ⁴³	04·027 ¹³	65·54 ¹²²
Feb. 10·6	13·622 ²⁵	33·73 ¹⁴	12·393 ²³	62·40 ⁶⁴	04·014 ¹⁹	64·32 ¹⁴⁵
20·5	13·647 ⁵⁴	33·59 ³³	12·416 ⁵⁴	61·76 ⁸⁵	04·033 ⁵²	62·87 ¹⁶⁸
Mar. 2·5	13·701 ⁸⁷	33·26 ⁵⁵	12·470 ⁸⁷	60·91 ¹⁰⁵	04·085 ⁸⁹	61·19 ¹⁸⁷
12·5	13·788 ¹²⁰	32·71 ⁷⁸	12·557 ¹²⁰	59·86 ¹²⁷	04·174 ¹²⁶	59·32 ²⁰³
22·5	13·908 ¹⁵⁶	31·93 ¹⁰¹	12·677 ¹⁵⁷	58·59 ¹⁴⁶	04·300 ¹⁶⁴	57·29 ²¹⁸
Apr. 1·4	14·064 ¹⁹⁰	30·92 ¹²⁴	12·834 ¹⁹²	57·13 ¹⁶⁵	04·464 ²⁰²	55·11 ²²⁷
11·4	14·254 ²²³	29·68 ¹⁴⁶	13·026 ²²⁵	55·48 ¹⁸⁰	04·666 ²³⁹	52·84 ²³³
21·4	14·477 ²⁵⁴	28·22 ¹⁶⁵	13·251 ²⁵⁷	53·68 ¹⁹³	04·905 ²⁷³	50·51 ²³⁵
May 1·3	14·731 ²⁸⁰	26·57 ¹⁸¹	13·508 ²⁸⁴	51·75 ²⁰²	05·178 ³⁰³	48·16 ²³⁰
11·3	15·011 ³⁰⁰	24·76 ¹⁹²	13·792 ³⁰⁵	49·73 ²⁰⁶	05·481 ³²⁷	45·86 ²²²
21·3	15·311 ³¹⁴	22·84 ²⁰⁰	14·097 ³²⁰	47·67 ²⁰⁴	05·808 ³⁴³	43·64 ²⁰⁸
31·3	15·625 ³²¹	20·84 ²⁰²	14·417 ³²⁸	45·63 ¹⁹⁸	06·151 ³⁵³	41·56 ¹⁸⁸
June 10·2	15·946 ³¹⁹	18·82 ¹⁹⁸	14·745 ³²⁷	43·65 ¹⁸⁷	06·504 ³⁵³	39·68 ¹⁶⁴
20·2	16·265 ³⁰⁹	16·84 ¹⁸⁹	15·072 ³¹⁷	41·78 ¹⁷¹	06·857 ³⁴⁴	38·04 ¹³⁷
30·2	16·574 ²⁹²	14·95 ¹⁷⁷	15·389 ³⁰⁰	40·07 ¹⁵¹	07·201 ³²⁶	36·67 ¹⁰⁵
July 10·2	16·866 ²⁶⁷	13·18 ¹⁵⁹	15·689 ²⁷⁶	38·56 ¹²⁷	07·527 ³⁰¹	35·62 ⁷¹
20·1	17·133 ²³⁵	11·59 ¹³⁹	15·965 ²⁴⁴	37·29 ¹⁰¹	07·828 ²⁶⁷	34·91 ³⁶
30·1	17·368 ¹⁹⁹	10·20 ¹¹⁶	16·209 ²⁰⁶	36·28 ⁷³	08·095 ²²⁷	34·55 ²
Aug. 9·1	17·567 ¹⁵⁹	09·04 ⁹¹	16·415 ¹⁶⁵	35·55 ⁴⁵	08·322 ¹⁸²	34·53 ³¹
19·0	17·726 ¹¹⁶	08·13 ⁶⁵	16·580 ¹²²	35·10 ¹⁷	08·504 ¹³⁴	34·84 ⁶²
29·0	17·842 ⁷³	07·48 ⁴¹	16·702 ⁷⁷	34·93 ⁸	08·638 ⁸⁵	35·46 ⁸⁹
Sept. 7·9	17·915 ³²	07·07 ¹⁸	16·779 ³⁴	35·01 ³²	08·723 ³⁶	36·35 ¹¹⁰
17·9	17·947 ⁶	06·89 ⁴	16·813 ⁶	35·33 ⁵¹	08·759 ⁹	37·45 ¹²⁶
27·9	17·941 ⁴¹	06·93 ²¹	16·807 ⁴³	35·84 ⁶⁶	08·750 ⁵⁰	38·71 ¹³⁵
Oct. 7·9	17·900 ⁶⁹	07·14 ³⁷	16·764 ⁷²	36·50 ⁷⁶	08·700 ⁸⁵	40·06 ¹³⁸
17·9	17·831 ⁹¹	07·51 ⁴⁹	16·692 ⁹⁶	37·26 ⁸³	08·615 ¹¹³	41·44 ¹³³
27·9	17·740 ¹⁰⁷	08·00 ⁵⁶	16·596 ¹¹³	38·09 ⁸³	08·502 ¹³³	42·77 ¹²⁴
Nov. 6·8	17·633 ¹¹⁶	08·56 ⁶²	16·483 ¹²²	38·92 ⁸¹	08·369 ¹⁴⁵	44·01 ¹⁰⁷
16·8	17·517 ¹¹⁹	09·18 ⁶⁴	16·361 ¹²⁶	39·73 ⁷⁴	08·224 ¹⁵⁰	45·08 ⁸⁶
26·8	17·398 ¹¹⁷	09·82 ⁶³	16·235 ¹²³	40·47 ⁶⁴	08·074 ¹⁴⁷	45·94 ⁶²
Dec. 6·7	17·281 ¹⁰⁹	10·45 ⁶⁰	16·112 ¹¹⁶	41·11 ⁵³	07·927 ¹⁴⁰	46·56 ³⁵
16·7	17·172 ⁹⁸	11·05 ⁵⁵	15·996 ¹⁰⁴	41·64 ³⁸	07·787 ¹²⁶	46·91 ⁶
26·7	17·074 ⁸²	11·60 ⁴⁸	15·892 ⁸⁸	42·02 ²³	07·661 ¹⁰⁷	46·97 ²²
36·7	16·992	12·08	15·804		07·554	46·75
Mean Place	13·432	33·14	12·165	60·90	03·777	61·61
Sec δ , Tan δ	1·010	— 0·139	1·041	— 0·290	1·154	— 0·577
a, a'	+3·1	+19·1	+3·2	+19·1	+3·3	+19·2
b, b'	—0·01	+ 0·3	—0·02	+ 0·3	—0·04	+ 0·3
Authority and Catalogue No.	B.J.	1428	B.J.	1430	B.J.	1431

APPARENT PLACES OF STARS, 1935

515

AT UPPER TRANSIT AT GREENWICH

Name	β Piscium		β Pegasi		α Pegasi	
	4.58	B ₅ p	2.61	Ma	2.57	Ao
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ₂₃ ^m ₀₀	[°] ₊ ['] ₃ ["] ₂₈	^h ₂₃ ^m ₀₀	[°] ₊ ['] ₂₇ ["] ₄₃	^h ₂₃ ^m ₀₁	[°] ₊ ['] ₁₄ ["] ₅₁
Jan. 1.7	34.391 ⁷⁷	15.53 ⁷⁸	37.210 ¹⁰⁸	59.81 ¹³³	31.464 ⁸⁶	26.74 ¹⁰⁷
11.7	34.314 ⁶¹	14.75 ⁷⁸	37.102 ⁸⁹	58.48 ¹⁵⁵	31.378 ⁷⁰	25.67 ¹¹⁸
21.6	34.253 ³⁹	13.97 ⁷³	37.013 ⁶⁵	56.93 ¹⁷⁰	31.308 ⁴⁸	24.49 ¹²⁴
31.6	34.214 ¹⁶	13.24 ⁶⁵	36.948 ³⁸	55.23 ¹⁷⁹	31.260 ²⁴	23.25 ¹²²
Feb. 10.6	34.198 ¹¹	12.59 ⁵³	36.910 ⁵	53.44 ¹⁷⁹	31.236 ⁴	22.03 ¹¹⁶
20.5	34.209 ⁴⁰	12.06 ³⁶	36.905 ³¹	51.65 ¹⁷¹	31.240 ³⁶	20.87 ¹⁰³
Mar. 2.5	34.249 ⁷³	11.70 ¹⁴	36.936 ⁷⁰	49.94 ¹⁵⁴	31.276 ⁷⁰	19.84 ⁸³
12.5	34.322 ¹⁰⁸	11.56 ⁹	37.006 ¹¹²	48.40 ¹²⁹	31.346 ¹⁰⁸	19.01 ⁵⁸
22.5	34.430 ¹⁴⁴	11.65 ³⁷	37.118 ¹⁵⁵	47.11 ⁹⁹	31.454 ¹⁴⁶	18.43 ²⁹
Apr. 1.4	34.574 ¹⁷⁹	12.02 ⁶⁵	37.273 ¹⁹⁶	46.12 ⁶¹	31.600 ¹⁸³	18.14 ⁴
11.4	34.753 ²¹⁵	12.67 ⁹⁴	37.469 ²³⁶	45.51 ²¹	31.783 ²²⁰	18.18 ³⁹
21.4	34.968 ²⁴⁶	13.61 ¹²¹	37.705 ²⁷¹	45.30 ²¹	32.003 ²⁵³	18.57 ⁷⁵
May 1.4	35.214 ²⁷³	14.82 ¹⁴⁷	37.976 ³⁰¹	45.51 ⁶⁵	32.256 ²⁸⁰	19.32 ¹⁰⁹
11.3	35.487 ²⁹⁵	16.29 ¹⁷⁰	38.277 ³²⁴	46.16 ¹⁰⁶	32.536 ³⁰³	20.41 ¹⁴¹
21.3	35.782 ³¹¹	17.99 ¹⁸⁸	38.601 ³³⁹	47.22 ¹⁴⁶	32.839 ³¹⁸	21.82 ¹⁶⁹
31.3	36.093 ³¹⁸	19.87 ²⁰²	38.940 ³⁴⁵	48.68 ¹⁸⁰	33.157 ³²⁵	23.51 ¹⁹⁴
June 10.2	36.411 ³¹⁷	21.89 ²⁰⁹	39.285 ³⁴²	50.48 ²¹¹	33.482 ³²⁴	25.45 ²¹⁴
20.2	36.728 ³⁰⁹	23.98 ²¹⁰	39.627 ³³⁰	52.59 ²³⁷	33.806 ³¹⁴	27.59 ²²⁷
30.2	37.037 ²⁹³	26.10 ²¹⁰	39.957 ³¹¹	54.96 ²⁵⁴	34.120 ²⁹⁷	29.86 ²³⁴
July 10.2	37.330 ²⁶⁹	28.20 ²⁰³	40.268 ²⁸⁴	57.50 ²⁶⁸	34.417 ²⁷²	32.20 ²³⁶
20.1	37.599 ²³⁹	30.23 ¹⁸⁹	40.552 ²⁵⁰	60.18 ²⁷³	34.689 ²⁴²	34.56 ²³²
30.1	37.838 ²⁰⁴	32.12 ¹⁷⁴	40.802 ²¹¹	62.91 ²⁷⁴	34.931 ²⁰⁵	36.88 ²²⁴
Aug. 9.1	38.042 ¹⁶⁵	33.86 ¹⁵⁴	41.013 ¹⁶⁹	65.65 ²⁶⁸	35.136 ¹⁶⁵	39.12 ²¹¹
19.1	38.207 ¹²⁵	35.40 ¹³²	41.182 ¹²⁵	68.33 ²⁵⁹	35.301 ¹²⁴	41.23 ¹⁹⁵
29.0	38.332 ⁸²	36.72 ¹¹⁰	41.307 ⁸⁰	70.92 ²⁴²	35.425 ⁸²	43.18 ¹⁷⁵
Sept. 7.9	38.414 ⁴³	37.82 ⁸⁷	41.387 ³⁷	73.34 ²²³	35.507 ⁴¹	44.93 ¹⁵²
17.9	38.457 ³	38.69 ⁶³	41.424 ³	75.57 ²⁰⁰	35.548 ³	46.45 ¹²⁹
27.9	38.460 ²⁸	39.32 ⁴⁰	41.421 ⁴⁰	77.57 ¹⁷³	35.551 ³⁰	47.74 ¹⁰⁵
Oct. 7.9	38.432 ⁵⁸	39.72 ²⁰	41.381 ⁷⁰	79.30 ¹⁴⁶	35.521 ⁶⁰	48.79 ⁷⁹
17.9	38.374 ⁸¹	39.92 ¹	41.311 ⁹⁶	80.76 ¹¹⁴	35.461 ⁸³	49.58 ⁵⁴
27.9	38.293 ⁹⁷	39.93 ¹⁸	41.215 ¹¹⁶	81.90 ⁸¹	35.378 ¹⁰⁰	50.12 ²⁹
Nov. 6.8	38.196 ¹⁰⁹	39.75 ³¹	41.099 ¹³⁰	82.71 ⁴⁸	35.278 ¹¹³	50.41 ⁴
16.8	38.087 ¹¹³	39.44 ⁴⁶	40.969 ¹³⁷	83.19 ¹³	35.165 ¹¹⁹	50.45 ²⁰
26.8	37.974 ¹¹⁴	38.98 ⁵⁷	40.832 ¹⁴¹	83.32 ²²	35.046 ¹²⁰	50.25 ⁴⁴
Dec. 6.8	37.860 ¹⁰⁹	38.41 ⁶⁷	40.691 ¹³⁸	83.10 ⁵⁶	34.926 ¹¹⁶	49.81 ⁶⁴
16.7	37.751 ¹⁰¹	37.74 ⁷³	40.553 ¹³¹	82.54 ⁸⁹	34.810 ¹¹⁰	49.17 ⁸⁴
26.7	37.650 ⁸⁹	37.01 ⁷⁹	40.422 ¹²⁰	81.65 ¹¹⁹	34.700 ⁹⁷	48.33 ¹⁰¹
36.7	37.561	36.22	40.302	80.46	34.603	47.32
Mean Place	34.066	11.27	37.135	47.85	31.230	18.76
Secδ, Tanδ	1.002	+ 0.061	1.130	+ 0.526	1.035	+ 0.265
a, a'	+3.1	+19.4	+2.9	+19.4	+3.0	+19.4
b, b'	0.00	+ 0.3	+0.03	+ 0.3	+0.02	+ 0.3
Authority and Catalogue No.	N.A.	1436	B.J.	1437	B.J.	1438

† Second transit, Sept. 7

APPARENT PLACES OF STARS, 1935 AT UPPER TRANSIT AT GREENWICH

Name	♈ Aquarii		♐ Tucanæ		♓ Piscium	
	3.80	Ko	4.10	Pa	3.85	Ko
Mag. Spect.						
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 23 05	^m -21 31	^h 23 13	^m -58 34	^h 23 13	^m + 2 55
Jan. 1.7	59.501 ⁸⁷	35.27 ⁴	39.501 ²⁴³	104.29 ¹³⁶	48.087 ⁸¹	41.41 ⁷⁴
11.7	59.414 ⁶⁹	35.23 ²⁷	39.258 ²⁰³	102.93 ¹⁸²	48.006 ⁶⁷	40.67 ⁷³
21.6	59.345 ⁴⁶	34.96 ⁵⁰	39.055 ¹⁵⁸	101.11 ²²³	47.939 ⁴⁸	39.94 ⁶⁹
31.6	59.299 ²¹	34.46 ⁷³	38.897 ¹⁰⁷	98.88 ²⁵⁹	47.891 ²⁵	39.25 ⁶⁰
Feb. 10.6	59.278 ⁷	33.73 ⁹⁶	38.790 ⁵²	96.29 ²⁸⁷	47.866	38.65 ⁴⁷
20.6	59.285 ³⁷	32.77 ¹¹⁸	38.738 ⁵	93.42 ³¹⁰	47.866 ²⁹	38.18 ³¹
Mar. 2.5	59.322 ⁷¹	31.59 ¹³⁹	38.743 ⁶⁶	90.32 ³²⁷	47.895 ⁶¹	37.87 ¹¹
12.5	59.393 ¹⁰⁷	30.20 ¹⁵⁹	38.809 ¹²⁸	87.05 ³³⁵	47.956 ⁹⁶	37.76 ¹³
22.5	59.500 ¹⁴⁴	28.61 ¹⁷⁸	38.937 ¹⁹¹	83.70 ³³⁷	48.052 ¹³²	37.89 ⁴⁰
Apr. 1.4	59.644 ¹⁸²	26.83 ¹⁹⁴	39.128 ²⁵²	80.33 ³³²	48.184 ¹⁶⁹	38.29 ⁶⁷
11.4	59.826 ²¹⁷	24.89 ²⁰⁶	39.380 ³¹¹	77.01 ³²¹	48.353 ²⁰⁵	38.96 ⁹⁵
21.4	60.043 ²⁵¹	22.83 ²¹⁵	39.691 ³⁶⁶	73.80 ³⁰²	48.558 ²³⁹	39.91 ¹²³
May 1.4	60.294 ²⁸¹	20.68 ²²⁰	40.057 ⁴¹⁴	70.78 ²⁷⁸	48.797 ²⁶⁷	41.14 ¹⁴⁸
11.3	60.575 ³⁰⁵	18.48 ²¹⁹	40.471 ⁴⁵⁵	68.00 ²⁴⁷	49.064 ²⁹¹	42.62 ¹⁶⁹
21.3	60.880 ³²³	16.29 ²¹³	40.926 ⁴⁸⁶	65.53 ²¹⁰	49.355 ³⁰⁹	44.31 ¹⁸⁷
31.3	61.203 ³³³	14.16 ²⁰³	41.412 ⁵⁰⁶	63.43 ¹⁶⁹	49.664 ³¹⁸	46.18 ²⁰¹
June 10.3	61.536 ³³⁵	12.13 ¹⁸⁶	41.918 ⁵¹²	61.74 ¹²⁴	49.982 ³²⁰	48.19 ²⁰⁹
20.2	61.871 ³²⁹	10.27 ¹⁶⁵	42.430 ⁵⁰⁸	60.50 ⁷⁸	50.302 ³¹⁴	50.28 ²¹¹
30.2	62.200 ³¹⁴	08.62 ¹⁴¹	42.938 ⁴⁸⁷	59.72 ²⁷	50.616 ²⁹⁹	52.39 ²⁰⁸
July 10.2	62.514 ²⁹¹	07.21 ¹¹³	43.425 ⁴⁵⁵	59.45 ²³	50.915 ²⁷⁸	54.47 ²⁰¹
20.1	62.805 ²⁶⁰	06.08 ⁸²	43.880 ⁴¹⁰	59.68 ⁷²	51.193 ²⁵⁰	56.48 ¹⁸⁸
30.1	63.065 ²²⁴	05.26 ⁵¹	44.290 ³⁵³	60.40 ¹¹⁸	51.443 ²¹⁶	58.36 ¹⁷²
Aug. 9.1	63.289 ¹⁸³	04.75 ¹⁹	44.643 ²⁸⁷	61.58 ¹⁵⁸	51.659 ¹⁷⁸	60.08 ¹⁵²
19.1	63.472 ¹³⁹	04.56 ¹¹	44.930 ²¹³	63.16 ¹⁹⁴	51.837 ¹³⁸	61.60 ¹³¹
29.0	63.611 ⁹⁴	04.67 ³⁹	45.143 ¹³⁶	65.10 ²²²	51.975 ⁹⁷	62.91 ¹⁰⁷
Sept. 8.0	63.705 ⁴⁹	05.06 ⁶²	45.279 ¹⁰	67.32 ²⁴¹	52.072 ¹⁰	63.98 ⁸⁴
17.9	63.754 ⁷	05.68 ⁸³	45.336 ²¹	69.73 ²⁵¹	52.129 ¹⁹	64.82 ⁶⁰
27.9	63.761 ³⁰	06.51 ⁹⁶	45.315 ⁹⁵	72.24 ²⁴⁹	52.148 ¹⁴	65.42 ³⁸
Oct. 7.9	63.731 ⁶⁵	07.47 ¹⁰⁶	45.220 ¹⁶¹	74.73 ²³⁹	52.134 ⁴⁶	65.80 ¹⁷
17.9	63.666 ⁹¹	08.53 ¹⁰⁹	45.059 ²¹⁸	77.12 ²¹⁷	52.088 ⁶⁸	65.97 ²
27.9	63.575 ¹¹⁰	09.62 ¹⁰⁶	44.841 ²⁶²	79.29 ¹⁸⁷	52.020 ⁸⁷	65.95 ¹⁹
Nov. 6.8	63.465 ¹²⁴	10.68 ⁹⁸	44.579 ²⁹⁴	81.16 ¹⁴⁷	51.933 ¹⁰⁰	65.76 ³⁴
16.8	63.341 ¹²⁹	11.66 ⁸⁷	44.285 ³¹⁴	82.63 ¹⁰³	51.833 ¹⁰⁷	65.42 ⁴⁶
26.8	63.212 ¹³⁰	12.53 ⁷¹	43.971 ³²⁰	83.66 ⁵³	51.726 ¹¹⁰	64.96 ⁵⁷
Dec. 6.8	63.082 ¹²⁵	13.24 ⁵³	43.651 ³¹⁴	84.19 ¹	51.616 ¹⁰⁷	64.39 ⁶⁵
16.7	62.957 ¹¹⁵	13.77 ³³	43.337 ²⁹⁶	84.20 ⁵²	51.509 ¹⁰²	63.74 ⁷²
26.7	62.842 ¹⁰¹	14.10 ¹¹	43.041 ²⁶⁸	83.68 ¹⁰⁴	51.407 ⁹²	63.02 ⁷⁵
36.7	62.741	14.21	42.773	82.64	51.315	62.27
Mean Place	59.012	31.75	38.927	92.19	47.685	36.99
Secd, Tanδ	1.075	-0.394	1.919	-1.638	1.001	+0.051
a, a'	+3.2	+19.5	+3.5	+19.6	+3.1	+19.6
b, b'	-0.03	+0.2	-0.11	+0.2	0.00	+0.2
Authority and Catalogue No.	B.J.	I444	B.J.	I452	A.N.	I453

† First transit, Sept. 8

APPARENT PLACES OF STARS, 1935

517

AT UPPER TRANSIT AT GREENWICH

Name	ψ^3 Aquarii		τ Pegasi		κ Piscium	
Mag. Spect.	5.16	Ao	4.65	A5	4.94	A2p
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h ^m 23 15	[°] ['] — 9 57	^h ^m 23 17	[°] ['] +23 23	^h ^m 23 23	[°] ['] + 0 53
Jan. 1.7	35.325 ⁸⁴	58.15 ³⁷	25.189 ¹⁰⁷	15.05 ¹¹⁶	36.430 ⁸⁶	62.61 ⁶⁸
11.7	35.241 ⁶⁸	58.52 ²⁴	25.082 ⁹¹	13.89 ¹³⁵	36.344 ⁷³	61.93 ⁶⁵
21.6	35.173 ⁵⁰	58.76 ⁹	24.991 ⁷¹	12.54 ¹⁴⁸	36.271 ⁵⁶	61.28 ⁵⁹
31.6	35.123 ²⁷	58.85 ⁸	24.920 ⁴⁸	11.06 ¹⁵⁵	36.215 ³⁶	60.69 ⁵⁰
Feb. 10.6	35.096 ¹	58.77 ²⁷	24.872 ¹⁸	09.51 ¹⁵⁴	36.179 ¹⁰	60.19 ³⁶
20.6	35.095 ²⁷	58.50 ⁴⁸	24.854 ¹⁶	07.97 ¹⁴⁶	36.169 ¹⁸	59.83 ¹⁸
Mar. 2.5	35.122 ⁶⁰	58.02 ⁶⁸	24.870 ⁵³	06.51 ¹³¹	36.187 ⁵⁰	59.65 ²
12.5	35.182 ⁹⁴	57.34 ⁹²	24.923 ⁹²	05.20 ¹⁰⁸	36.237 ⁸⁵	59.67 ²⁵
22.5	35.276 ¹²⁹	56.42 ¹¹⁵	25.015 ¹³⁴	04.12 ⁷⁸	36.322 ¹²¹	59.92 ⁵¹
Apr. 1.4	35.405 ¹⁶⁷	55.27 ¹³⁷	25.149 ¹⁷⁶	03.34 ⁴⁶	36.443 ¹⁵⁹	60.43 ⁷⁷
11.4	35.572 ²⁰²	53.90 ¹⁵⁷	25.325 ²¹⁶	02.88 ⁸	36.602 ¹⁹⁵	61.20 ¹⁰⁴
21.4	35.774 ²³⁶	52.33 ¹⁷⁶	25.541 ²⁵²	02.80 ³²	36.797 ²³⁰	62.24 ¹³⁰
May 1.4	36.010 ²⁶⁶	50.57 ¹⁹⁰	25.793 ²⁸⁴	03.12 ⁷¹	37.027 ²⁶⁰	63.54 ¹⁵⁴
11.3	36.276 ²⁸⁹	48.67 ²⁰¹	26.077 ³⁰⁹	03.83 ¹⁰⁹	37.287 ²⁸⁶	65.08 ¹⁷⁴
21.3	36.565 ³⁰⁹	46.66 ²⁰⁶	26.386 ³²⁷	04.92 ¹⁴⁴	37.573 ³⁰⁵	66.82 ¹⁹⁰
31.3	36.874 ³¹⁹	44.60 ²⁰⁷	26.713 ³³⁶	06.36 ¹⁷⁷	37.878 ³¹⁶	68.72 ²⁰²
June 10.3	37.193 ³²³	42.53 ²⁰²	27.049 ³³⁷	08.13 ²⁰³	38.194 ³¹⁹	70.74 ²⁰⁸
20.2	37.516 ³¹⁷	40.51 ¹⁹²	27.386 ³²⁸	10.16 ²²⁶	38.513 ³¹⁶	72.82 ²⁰⁹
30.2	37.833 ³⁰³	38.59 ¹⁷⁸	27.714 ³¹⁴	12.42 ²⁴¹	38.829 ³⁰²	74.91 ²⁰⁴
July 10.2	38.136 ²⁸³	36.81 ¹⁵⁹	28.028 ²⁸⁹	14.83 ²⁵²	39.131 ²⁸²	76.95 ¹⁹⁵
20.1	38.419 ²⁵⁵	35.22 ¹³⁶	28.317 ²⁵⁹	17.35 ²⁵⁶	39.413 ²⁵⁵	78.90 ¹⁸⁰
30.1	38.674 ²²¹	33.86 ¹¹²	28.576 ²²³	19.91 ²⁵⁴	39.668 ²²²	80.70 ¹⁶³
Aug. 9.1	38.895 ¹⁸²	32.74 ⁸⁴	28.799 ¹⁸⁴	22.45 ²⁴⁸	39.890 ¹⁸⁶	82.33 ¹⁴²
19.1	39.077 ¹⁴³	31.90 ⁵⁸	28.983 ¹⁴²	24.93 ²³⁶	40.076 ¹⁴⁶	83.75 ¹²⁰
29.0	39.220 ¹⁰⁰	31.32 ³¹	29.125 ⁹⁹	27.29 ²²⁰	40.222 ¹⁰⁶	84.95 ⁹⁵
Sept. 8.0	39.320 ⁵⁸	31.01 ⁵	29.224 ⁵⁷	29.49 ²⁰¹	40.328 ⁶⁵	85.90 ⁷¹
17.9	39.378 ¹⁹	30.96 ¹⁶	29.281 ¹⁸	31.50 ¹⁷⁸	40.393 ²⁸	86.61 ⁴⁸
27.9	39.397 ¹⁶	31.12 ³⁶	29.299 ¹⁸	33.28 ¹⁵⁴	40.421 ⁷	87.09 ²⁶
Oct. 7.9	39.381 ⁴⁸	31.48 ⁵²	29.281 ⁴⁹	34.82 ¹²⁸	40.414 ³⁷	87.35 ⁵
17.9	39.333 ⁷³	32.00 ⁶³	29.232 ⁷⁶	36.10 ⁹⁹	40.377 ⁶²	87.40 ¹³
27.9	39.260 ⁹²	32.63 ⁷⁰	29.156 ⁹⁶	37.09 ⁷⁰	40.315 ⁸²	87.27 ²⁸
Nov. 6.8	39.168 ¹⁰⁵	33.33 ⁷⁴	29.060 ¹¹²	37.79 ⁴⁰	40.233 ⁹⁵	86.99 ⁴¹
16.8	39.063 ¹¹³	34.07 ⁷³	28.948 ¹²²	38.19 ²	40.138 ¹⁰⁵	86.58 ⁵¹
26.8	38.950 ¹¹⁵	34.80 ⁷¹	28.826 ¹²⁷	38.28 ²¹	40.033 ¹⁰⁹	86.07 ⁶⁰
Dec. 6.8	38.835 ¹¹²	35.51 ⁶⁵	28.699 ¹²⁹	38.07 ⁵¹	39.924 ¹⁰⁸	85.47 ⁶⁶
16.7	38.723 ¹⁰⁵	36.16 ⁵⁶	28.570 ¹²⁴	37.56 ⁷⁸	39.816 ¹⁰⁴	84.81 ⁶⁹
26.7	38.618 ⁹⁶	36.72 ⁴⁷	28.446 ¹¹⁶	36.78 ¹⁰⁴	39.712 ⁹⁶	84.12 ⁷¹
36.7	38.522	37.19	28.330	35.74	39.616	83.41
Mean Place	34.836	58.37	24.945	03.77	35.959	58.61
Sec'd, Tan'd	1.015	— 0.176	1.089	+ 0.432	1.000	+ 0.016
α, α'	+3.1	+19.7	+3.0	+19.7	+3.1	+19.8
δ, δ'	—0.01	+ 0.2	+0.03	+ 0.2	0.00	+ 0.2
Authority and Catalogue No.	N.A.	1455	B.J.	1457	B.J.	1464

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	72 Pegasi m.		Phoenixis		Piscium	
Mag. Spect.	5.21	K2	4.80	A2p	4.28	F8
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 23 ^m 30	+30° 57'	^h 23 ^m 31	-42° 57'	^h 23 ^m 36	+5° 16'
Jan. 1.7	43.627 ¹²⁷	73.23 ¹¹⁶	35.838 ¹⁵⁷	97.64 ⁶⁴	36.840 ⁹³	31.93 ⁷⁸
11.7	43.500 ¹¹⁴	72.07 ¹⁴²	35.681 ¹³⁵	97.00 ¹⁰⁵	36.747 ⁸¹	31.15 ⁷⁸
21.6	43.386	70.65 ¹⁶²	35.546 ¹⁰⁸	95.95 ¹⁴³	36.666 ⁶⁷	30.37 ⁷⁶
31.6	43.291 ⁹⁵	69.03 ¹⁷⁶	35.438 ⁷⁸	94.52 ¹⁷⁸	36.599 ⁴⁷	29.61 ⁷¹
Feb. 10.6	43.221 ⁷⁰	67.27 ¹⁸²	35.360 ⁴²	92.74 ²⁰⁹	36.552 ²³	28.90 ⁵⁹
20.6	43.181	65.45 ¹⁷⁹	35.318 ⁴	90.65 ²³⁵	36.529 ⁵	28.31 ⁴⁴
Mar. 2.5	43.178 ³⁶	63.66 ¹⁶⁹	35.314 ³⁷	88.30 ²⁵⁷	36.534 ³⁶	27.87 ²⁶
12.5	43.214 ⁷⁹	61.97 ¹⁴⁹	35.351 ⁸³	85.73 ²⁷⁵	36.570 ⁷²	27.61 ²³
22.5	43.293 ¹²⁵	60.48 ¹²²	35.434 ¹²⁸	82.98 ²⁸⁷	36.642 ¹¹⁰	27.59 ²³
Apr. 1.5	43.418 ¹⁷¹	59.26 ⁸⁹	35.562 ¹⁷⁵	80.11 ²⁹³	36.752 ¹⁴⁸	27.82 ⁵⁰
11.4	43.589 ²¹⁵	58.37 ⁵¹	35.737 ²²²	77.18 ²⁹³	36.900 ¹⁸⁶	28.32 ⁸⁰
21.4	43.804 ²⁵⁵	57.86 ¹⁰	35.959 ²⁶⁵	74.25 ²⁸⁹	37.086 ²²³	29.12 ¹⁰⁸
May 1.4	44.059 ²⁹¹	57.76 ³³	36.224 ³⁰⁵	71.36 ²⁷⁶	37.309 ²⁵⁴	30.20 ¹³⁴
11.3	44.350 ³¹⁹	58.09 ⁷⁵	36.529 ³³⁹	68.60 ²⁵⁹	37.563 ²⁸²	31.54 ¹⁵⁸
21.3	44.669 ³⁴⁰	58.84 ¹¹⁶	36.868 ³⁶⁷	66.01 ²³⁷	37.845 ³⁰²	33.12 ¹⁷⁹
31.3	45.009 ³⁵²	60.00 ¹⁵⁵	37.235 ³⁸⁴	63.64 ²⁰⁶	38.147 ³¹⁶	34.91 ¹⁹⁴
June 10.3	45.361 ³⁵⁵	61.55 ¹⁸⁹	37.619 ³⁹⁴	61.58 ¹⁷³	38.463 ³²²	36.85 ²⁰⁵
20.2	45.716 ³⁴⁸	63.44 ²¹⁶	38.013 ³⁹³	59.85 ¹³⁴	38.785 ³¹⁸	38.90 ²¹²
30.2	46.064 ³³³	65.60 ²⁴⁰	38.406 ³⁸²	58.51 ⁹³	39.103 ³⁰⁷	41.02 ²¹⁰
July 10.2	46.397 ³¹¹	68.00 ²⁵⁸	38.788 ³⁵⁹	57.58 ⁵⁰	39.410 ²⁸⁹	43.12 ²⁰⁶
20.2	46.708 ²⁸⁰	70.58 ²⁶⁹	39.147 ³³⁰	57.08 ⁵	39.699 ²⁶³	45.18 ¹⁹⁵
30.1	46.988 ²⁴⁴	73.27 ²⁷⁴	39.477 ²⁹⁰	57.03 ³⁸	39.962 ²³²	47.13 ¹⁸¹
Aug. 9.1	47.232 ²⁰³	76.01 ²⁷³	39.767 ²⁴³	57.41 ⁸⁰	40.194 ¹⁹⁷	48.94 ¹⁶³
19.1	47.435 ¹⁶¹	78.74 ²⁶⁸	40.010 ¹⁹²	58.21 ¹¹⁷	40.391 ¹⁵⁸	50.57 ¹⁴³
29.0	47.596 ¹¹⁷	81.42 ²⁵⁶	40.202 ¹³⁷	59.38 ¹⁴⁹	40.549 ¹¹⁹	52.00 ¹²⁰
Sept. 8.0	47.713 ⁷²	83.98 ²⁴⁰	40.339 ⁸⁰	60.87 ¹⁷⁶	40.668 ⁷⁹	53.20 ⁹⁷
17.9	47.785 ³¹	86.38 ²²⁰	40.419 ²⁵	62.63 ¹⁹⁴	40.747 ⁴¹	54.17 ⁷³
27.9	47.816 ⁶	88.58 ¹⁹⁷	40.444 ²⁷	64.57 ²⁰⁴	40.788 ⁷	54.90 ⁵⁰
Oct. 7.9	47.810 ⁴¹	90.55 ¹⁷⁰	40.417 ⁷³	66.61 ²⁰⁵	40.795 ²⁴	55.40 ²⁹
17.9	47.769 ⁷¹	92.25 ¹⁴¹	40.344 ¹¹⁵	68.66 ¹⁹⁷	40.771 ⁵¹	55.69 ⁸
27.9	47.698 ⁹⁶	93.66 ¹⁰⁹	40.229 ¹⁴⁶	70.63 ¹⁸⁰	40.720 ⁷¹	55.77 ¹⁰
Nov. 6.9	47.602 ¹¹⁴	94.75 ⁷⁶	40.083 ¹⁷¹	72.43 ¹⁵⁶	40.649 ⁸⁷	55.67 ²⁷
16.8	47.488 ¹²⁹	95.51 ⁴⁰	39.912 ¹⁸⁵	73.99 ¹²⁵	40.562 ⁹⁸	55.40 ⁴⁰
26.8	47.359 ¹³⁷	95.91 ³¹	39.727 ¹⁹⁴	75.24 ⁸⁷	40.464 ¹⁰⁵	55.00 ⁵³
Dec. 6.8	47.222 ¹⁴²	95.95 ⁶⁶	39.533 ¹⁹³	76.11 ⁴⁹	40.359 ¹⁰⁷	54.47 ⁶³
16.7	47.080 ¹⁴²	95.64 ⁶⁶	39.340 ¹⁸⁵	76.60 ⁶	40.252 ¹⁰⁶	53.84 ⁷²
26.7	46.938 ¹³⁶	94.98 ⁹⁸	39.155 ¹⁷³	76.66 ³⁶	40.146 ¹⁰⁰	53.12 ⁷⁷
36.7	46.802	94.00	38.982	76.30	40.046	52.35
Mean Place	43.383	59.14	35.141	88.57	36.321	26.13
Secδ, Tanδ	1.166	+0.600	1.367	-0.932	1.004	+0.092
a, a'	+3.0	+19.9	+3.2	+19.9	+3.1	+19.9
b, b'	+0.04	+0.1	-0.06	+0.1	+0.01	+0.1
Authority and Catalogue No.	A.N.	1471	N.A.	1474	B.J.	1479

APPARENT PLACES OF STARS, 1935

519

AT UPPER TRANSIT AT GREENWICH

Name	γ Cephei		λ Piscium		δ Sculptoris	
Mag. Spect.	3.42	Ko	4.61	A5	4.64	Ao
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 23 ^m 36	+77° 16'	^h 23 ^m 38	+ 1° 25'	^h 23 ^m 45	-28° 28'
Jan. 1.7	37.37 ⁸⁶	34.52 ⁸²	44.268 ⁹³	24.87 ⁶⁸	33.324 ¹²¹	88.00 ⁸
11.7	36.51 ⁷⁹	33.70 ¹⁴⁰	44.175 ⁸³	24.19 ⁶⁶	33.203 ¹⁰⁷	87.92 ³⁸
21.7	35.72 ⁷⁰	32.30 ¹⁹⁴	44.092 ⁶⁷	23.53 ⁵⁹	33.096 ⁸⁹	87.54 ⁷⁰
31.6	35.02 ⁵⁸	30.36 ²³⁹	44.025 ⁴⁸	22.94 ⁵⁰	33.007 ⁶⁶	86.84 ⁹⁹
Feb. 10.6	34.44 ⁴³	27.97 ²⁷⁵	43.977 ²⁵	22.44 ³⁸	32.941 ⁴¹	85.85 ¹²⁸
20.6	34.01 ²⁶	25.22 ²⁹⁷	43.952 ³	22.06 ²¹	32.900 ¹⁰	84.57 ¹⁵⁵
Mar. 2.5	33.75 ⁹	22.25 ³⁰⁸	43.955 ³⁴	21.85 [—]	32.890 ²⁴	83.02 ¹⁷⁸
12.5	33.66 ¹⁰	19.17 ³⁰⁶	43.989 ⁶⁹	21.85 ²²	32.914 ⁶¹	81.24 ²⁰¹
22.5	33.76 ²⁹	16.11 ²⁹¹	44.058 ¹⁰⁶	22.07 ⁴⁷	32.975 ¹⁰²	79.23 ²²⁰
Apr. 1.5	34.05 ⁴⁷	13.20 ²⁶⁵	44.164 ¹⁴⁴	22.54 ⁷⁴	33.077 ¹⁴²	77.03 ²³⁴
11.4	34.52 ⁶³	10.55 ²²⁹	44.308 ¹⁸³	23.28 ¹⁰⁰	33.219 ¹⁸⁴	74.69 ²⁴⁶
21.4	35.15 ⁷⁸	08.26 ¹⁸⁵	44.491 ²¹⁸	24.28 ¹²⁶	33.403 ²²⁴	72.23 ²⁵²
May 1.4	35.93 ⁸⁹	06.41 ¹³³	44.709 ²⁵⁰	25.54 ¹⁵⁰	33.627 ²⁶⁰	69.71 ²⁵²
11.4	36.82 ⁹⁸	05.08 ⁷⁸	44.959 ²⁷⁸	27.04 ¹⁷¹	33.887 ²⁹²	67.19 ²⁴⁹
21.3	37.80 ¹⁰⁴	04.30 ²¹	45.237 ²⁹⁹	28.75 ¹⁸⁸	34.179 ³¹⁸	64.70 ²³⁸
31.3	38.84 ¹⁰⁷	04.09 ³⁸	45.536 ³¹³	30.63 ¹⁹⁹	34.497 ³³⁵	62.32 ²²²
June 10.3	39.91 ¹⁰⁷	04.47 ⁹⁵	45.849 ³¹⁹	32.62 ²⁰⁷	34.832 ³⁴⁵	60.10 ²⁰⁰
20.2	40.98 ¹⁰⁴	05.42 ¹⁵¹	46.168 ³¹⁷	34.69 ²⁰⁸	35.177 ³⁴⁷	58.10 ¹⁷⁶
30.2	42.02 ⁹⁸	06.93 ²⁰¹	46.485 ³⁰⁷	36.77 ²⁰⁵	35.524 ³³⁸	56.34 ¹⁴³
July 10.2	43.00 ⁹⁰	08.94 ²⁴⁶	46.792 ²⁸⁸	38.82 ¹⁹⁷	35.862 ³²¹	54.91 ¹¹⁰
20.2	43.90 ⁸¹	11.40 ²⁸⁶	47.080 ²⁶⁵	40.79 ¹⁸³	36.183 ²⁹⁶	53.81 ⁷²
30.1	44.71 ⁶⁸	14.26 ³²⁰	47.345 ²³³	42.62 ¹⁶⁶	36.479 ²⁶⁴	53.09 ³⁵
Aug. 9.1	45.39 ⁵⁶	17.46 ³⁴⁷	47.578 ¹⁹⁷	44.28 ¹⁴⁵	36.743 ²²⁶	52.74 ³
19.1	45.95 ⁴²	20.93 ³⁶⁷	47.775 ¹⁶⁰	45.73 ¹²³	36.969 ¹⁸³	52.77 ³⁹
29.1	46.37 ²⁷	24.60 ³⁷⁸	47.935 ¹²⁰	46.96 ⁹⁹	37.152 ¹³⁷	53.16 ⁷²
Sept. 8.0	46.64 ¹⁶	28.38 ³⁸³	48.055 ⁸¹	47.95 ⁷⁵	37.289 ⁹¹	53.88 ¹⁰¹
17.9	46.77 ²	32.21 ³⁸⁰	48.136 ⁴³	48.70 ⁵⁰	37.380 ⁴⁷	54.89 ¹²⁴
27.9	46.75 ¹⁷	36.01 ³⁶⁸	48.179 ⁷	49.20 ²⁸	37.427 ⁴	56.13 ¹⁴¹
Oct. 7.9	46.58 ³⁰	39.69 ³⁴⁹	48.186 ²³	49.48 ⁷	37.431 ³⁴	57.54 ¹⁵²
17.9	46.28 ⁴⁴	43.18 ³²¹	48.163 ⁵⁰	49.55 ¹¹	37.397 ⁶⁷	59.06 ¹⁵⁴
27.9	45.84 ⁵⁵	46.39 ²⁸⁷	48.113 ⁷²	49.44 ²⁷	37.330 ⁹⁵	60.60 ¹⁵⁰
Nov. 6.9	45.29 ⁶⁶	49.26 ²⁴⁴	48.041 ⁸⁷	49.17 ⁴⁰	37.235 ¹¹⁵	62.10 ¹³⁸
16.8	44.63 ⁷⁵	51.70 ¹⁹⁵	47.954 ⁹⁸	48.77 ⁵²	37.120 ¹²⁹	63.48 ¹²²
26.8	43.88 ⁸²	53.65 ¹⁴¹	47.856 ¹⁰⁵	48.25 ⁵⁹	36.991 ¹³⁸	64.70 ⁹⁹
Dec. 6.8	43.06 ⁸⁷	55.06 ⁸⁰	47.751 ¹⁰⁷	47.66 ⁶⁶	36.853 ¹⁴⁰	65.69 ⁷³
16.8	42.19 ⁸⁸	55.86 ¹⁸	47.644 ¹⁰⁶	47.00 ⁶⁹	36.713 ¹³⁸	66.42 ⁴⁵
26.7	41.31 ⁸⁷	56.04 ⁴⁵	47.538 ¹⁰¹	46.31 ⁷¹	36.575 ¹³⁰	66.87 ¹³
36.7	40.44	55.59	47.437	45.60	36.445	67.00
Mean Place	39.566	10.19	43.713	20.36	32.591	82.87
Secδ, Tanδ	4.538	+ 4.426	1.000	+ 0.025	1.138	- 0.543
a, a'	+2.5	+19.9	+3.1	+20.0	+3.1	+20.0
b, b'	+0.29	+ 0.1	0.00	+ 0.1	-0.04	+ 0.1
Authority and Catalogue No.	B.J.	1480	N.A.	1482	B.J.	1488

† First transit, Sept. 18

APPARENT PLACES OF STARS, 1935

AT UPPER TRANSIT AT GREENWICH

Name	ϕ Pegasi		27 Piscium		ω Piscium	
	5.23	Ma	5.07	Ko	4.03	F ₅
Mean Solar Date	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.
	^h 23 ^m 49	^s +18 45	^h 23 ^m 55	^s - 3 54	^h 23 ^m 55	^s + 6 30
Jan. 1.7	11.153	110 44.42	21.370	56.67	58.911	19.31
11.7	11.043	100 43.49	21.272	57.24	58.812	18.56
21.7	10.943	87 42.41	21.182	57.73	58.720	17.78
31.6	10.856	77 41.22	21.105	58.10	58.640	17.02
Feb. 10.6	10.789	67 39.98	21.045	58.34	58.577	16.30
20.6	10.746	43 38.75	21.006	58.41	58.536	15.68
Mar. 2.6	10.732	14 37.59	20.993	58.30	58.521	15.20
12.5	10.752	20 36.57	21.011	57.97	58.538	14.89
22.5	10.811	59 35.75	21.063	57.42	58.590	14.79
Apr. 1.5	10.910	99 35.18	21.152	56.63	58.680	14.95
11.4	11.052	183 34.90	21.280	55.60	58.809	15.37
21.4	11.235	183 34.95	21.446	54.32	58.979	16.08
May 1.4	11.458	223 35.35	21.650	52.82	59.186	17.07
11.4	11.716	258 36.10	21.888	51.12	59.428	18.33
21.3	12.003	287 37.18	22.156	49.26	59.700	19.84
31.3	12.313	310 38.58	22.448	47.27	59.996	21.56
June 10.3	12.639	326 40.27	22.757	45.20	60.308	23.46
20.3	12.971	332 42.19	23.074	43.12	60.629	25.48
30.2	13.302	331 44.30	23.393	41.06	60.949	27.56
July 10.2	13.622	322 46.54	23.705	39.09	61.261	29.67
20.2	13.924	277 48.86	24.001	37.25	61.558	31.74
30.1	14.201	246 51.19	24.275	35.58	61.833	33.73
Aug. 9.1	14.447	211 53.50	24.521	34.13	62.078	35.59
19.1	14.658	172 55.72	24.733	32.92	62.291	37.28
29.1	14.830	132 57.82	24.908	31.96	62.466	38.78
Sept. 8.0	14.962	93 59.76	25.045	31.27	62.603	40.06
18.0	15.055	54 61.51	25.143	30.84	62.701	41.10
27.9	15.109	18 63.05	25.202	30.66	62.762	41.91
Oct. 7.9	15.127	18 64.36	25.225	30.71	62.788	42.49
17.9	15.113	42 65.43	25.216	30.95	62.782	42.85
27.9	15.071	42 66.25	25.180	31.35	62.749	43.01
Nov. 6.9	15.006	65 66.82	25.120	31.88	62.693	42.97
16.8	14.921	85 67.14	25.042	32.51	62.618	42.77
26.8	14.822	99 67.21	24.950	33.19	62.529	42.42
Dec. 6.8	14.713	109 67.03	24.850	33.91	62.431	41.94
16.8	14.598	115 66.61	24.744	34.62	62.326	41.35
26.7	14.480	118 65.97	24.636	35.31	62.219	40.67
36.7	14.365	115 65.13	24.532	35.95	62.114	39.92
Mean Place	10.652	33.68	20.692	59.67	58.284	12.64
Sec δ , Tan δ	1.056	+ 0.340	1.002	- 0.068	1.006	+ 0.114
a, a'	+3.1	+20.0	+3.1	+20.0	+3.1	+20.0
b, b'	+0.02	0.0	0.00	0.0	+0.01	0.0
Authority and Catalogue No.	B.J.	1491	A.N.	1498	B.J.	1500

There will be seven eclipses, five of the Sun and two of the Moon.

I	January 5	...	Partial eclipse of the Sun	...	Page 522
II	January 19	...	Total eclipse of the Moon	...	Page 523
III	February 3	...	Partial eclipse of the Sun	...	Pages 524-526
IV	June 30	...	Partial eclipse of the Sun	...	Pages 527-529
V	July 16 ...	...	Total eclipse of the Moon	...	Page 530
VI	July 30 ...	...	Partial eclipse of the Sun	...	Pages 531-532
VII	December 25	...	Annular eclipse of the Sun	...	Pages 533-535

II—*A Total Eclipse of the Moon*, January 19, partly visible at Greenwich; the beginning visible generally in eastern Europe, Asia, Australia, the eastern part of the Indian Ocean, the Pacific Ocean, and western North America; the ending visible generally in Europe, Africa except the extreme western part, the Indian Ocean, Australia, the western part of the Pacific Ocean, and the extreme north-western part of North America.

ELEMENTS OF THE ECLIPSE

G.M.T. of opposition in right ascension	Jan.	19 ^d	15 ^h	37 ^m	44 ^s ·6
Sun's right ascension	20	03	06·08
Hourly motion	10·63
Moon's right ascension	8	03	06·08
Hourly motion	122·20

Sun's declination ... ..	...	...	...	...	-20° 26' 20·7
Hourly motion ... ..	...	...	...	...	+ 31·1
Moon's declination ... ..	...	...	...	...	+20 40 31·9
Hourly motion ... ..	...	...	...	...	- 8 45·6
Sun's equatorial horizontal parallax ... ..	...	...	...	...	8·9
Sun's true semidiameter ... ..	...	...	...	...	16 15·3
Moon's equatorial horizontal parallax ... ..	...	...	...	...	54 13·3
Moon's true semidiameter ... ..	...	...	...	...	14 45·7

CIRCUMSTANCES OF THE ECLIPSE

Moon enters penumbra ... ..	...	...	...	Jan. 19 ^d	12 ^h	38 ^m ·7
Moon enters umbra ... ..	...	...	...	19	13	53·2
Total eclipse begins ... ..	...	...	...	19	15	03·5
Middle of the eclipse ... ..	...	...	...	19	15	47·1
Total eclipse ends ... ..	...	...	...	19	16	30·7
Moon leaves umbra ... ..	...	...	...	19	17	40·7
Moon leaves penumbra ... ..	...	...	...	19	18	54·7

Contact of umbra with Moon's limb	Position angle	The Moon being in the zenith in	
		Longitude	Latitude
First	122°	-153° 33'	+20° 56'
Last	273	- 98 28	+20 22

Magnitude of the eclipse 1·355 (Moon's diameter = 1·0)

ECLIPSES, 1935

III—A *Partial Eclipse of the Sun*, February 3, invisible at Greenwich.

ELEMENTS OF THE ECLIPSE

G.M.T. of conjunction in right ascension	Feb.	^d 3	^h 17	^m 04	^s 06.5	
Sun and Moon's right ascension	...	...	21	05	41.45	
Sun's hourly motion	...	...	...	...	10.14	
Moon's hourly motion	...	...	...	...	147.13	
Sun's declination	...	...	...	...	-16° 38'	48.3
Hourly motion	...	...	...	...	+	43.9
Moon's declination	...	...	...	...	-15° 23'	04.7
Hourly motion	...	...	...	...	+	14 15.5
Sun's equatorial horizontal parallax	...	...	...	...	...	8.9
Sun's true semidiameter	...	...	...	...	16	13.5
Moon's equatorial horizontal parallax	...	...	...	...	61	25.2
Moon's true semidiameter	...	...	...	...	16	43.3

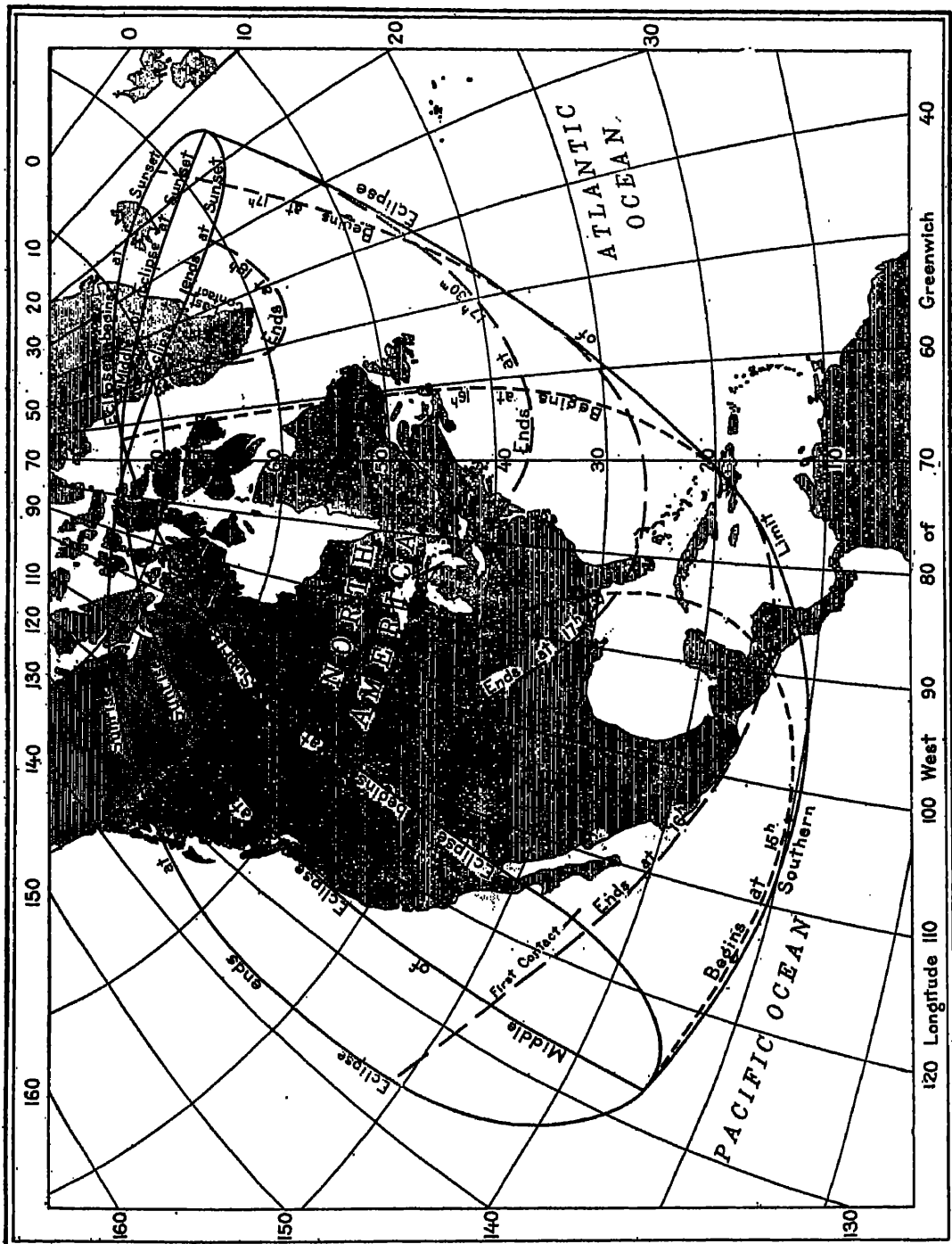
CIRCUMSTANCES OF THE ECLIPSE

		G.M.T.	Longitude	Latitude
Eclipse begins	...	Feb. ^d 3 ^h 14 ^m 30.1	+116° 05'	+24° 48'
Greatest eclipse	...	3 16 15.9	+115 19	+62 33
Eclipse ends	...	3 18 01.3	+ 35 53	+64 37

Magnitude of greatest eclipse 0.739 (Sun's diameter = 1.0)

At Montreal the greatest magnitude is 0.46

		G.M.T.	P	V
Eclipse begins	...	Feb. ^d 3 ^h 15 ^m 33	274°	292°
Greatest eclipse	...	3 16 36	...	...
Eclipse ends	...	3 17 40	25	18



PARTIAL ECLIPSE OF FEBRUARY 3

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN,
FEBRUARY 3

Green- wich Mean Time	Co-ordinates of Centre of Shadow on Fundamental Plane		Direction of Axis of Shadow			Radius of Penumbra on Funda- mental Plane
	<i>x</i>	<i>y</i>	$\sin d$	$\cos d$	μ	l_1
<i>h m</i>					$^{\circ}$ $'$	
14 30	-1.38441	+0.66946	-0.28703	+0.95792	34 01.3	+0.53770
40	1.29458	0.70619	0.28699	0.95793	36 31.3	0.53771
50	1.20474	0.74292	0.28696	0.95794	39 01.3	0.53771
15 00	-1.11491	+0.77966	-0.28693	+0.95795	41 31.3	+0.53771
10	1.02508	0.81640	0.28689	0.95796	44 01.3	0.53771
20	0.93524	0.85315	0.28686	0.95797	46 31.3	0.53771
30	0.84541	0.88990	0.28683	0.95798	49 01.3	0.53771
40	0.75557	0.92665	0.28679	0.95799	51 31.3	0.53771
50	0.66573	0.96340	0.28676	0.95801	54 01.3	0.53771
16 00	-0.57590	+1.00016	-0.28673	+0.95802	56 31.3	+0.53771
10	0.48607	1.03692	0.28669	0.95803	59 01.3	0.53771
20	0.39624	1.07369	0.28666	0.95804	61 31.3	0.53771
30	0.30640	1.11045	0.28663	0.95805	64 01.3	0.53770
40	0.21657	1.14722	0.28660	0.95806	66 31.3	0.53770
50	0.12673	1.18399	0.28657	0.95807	69 01.3	0.53770
17 00	-0.03690	+1.22076	-0.28654	+0.95808	71 31.4	+0.53769
10	+0.05293	1.25754	0.28650	0.95809	74 01.4	0.53768
20	0.14276	1.29432	0.28647	0.95810	76 31.4	0.53768
30	0.23258	1.33110	0.28644	0.95811	79 01.4	0.53767
40	0.32240	1.36788	0.28640	0.95811	81 31.4	0.53766
50	0.41222	1.40466	0.28637	0.95812	84 01.4	0.53765
18 00	+0.50203	+1.44145	-0.28634	+0.95812	86 31.4	+0.53764
10	+0.59184	+1.47824	-0.28631	+0.95813	89 01.4	+0.53763

$$\tan f_1 = 0.00474$$

$$l' = 0.004363 \rho \cos \phi' \cos (\mu - \lambda)$$

$$\eta' = -0.001251 \xi$$

IV—A *Partial Eclipse of the Sun*, June 30, partly visible at Greenwich.

ELEMENTS OF THE ECLIPSE

G.M.T. of conjunction in right ascension	June 30	^d 19	^h 34	^m 47.2	
Sun and Moon's right ascension	...	...	6	35	07.54
Sun's hourly motion	...	...	...	...	10.36
Moon's hourly motion	...	...	...	...	137.26
Sun's declination	...	...	...	+23	[°] 12' 10.6
Hourly motion	...	...	...	—	8.7
Moon's declination	...	...	...	+24	28 51.4
Hourly motion	...	...	...	—	4 43.2
Sun's equatorial horizontal parallax	...	...	...	...	8.7
Sun's true semidiameter	...	...	...	15	43.8
Moon's equatorial horizontal parallax	...	...	...	55	45.2
Moon's true semidiameter	...	...	...	15	10.8

CIRCUMSTANCES OF THE ECLIPSE

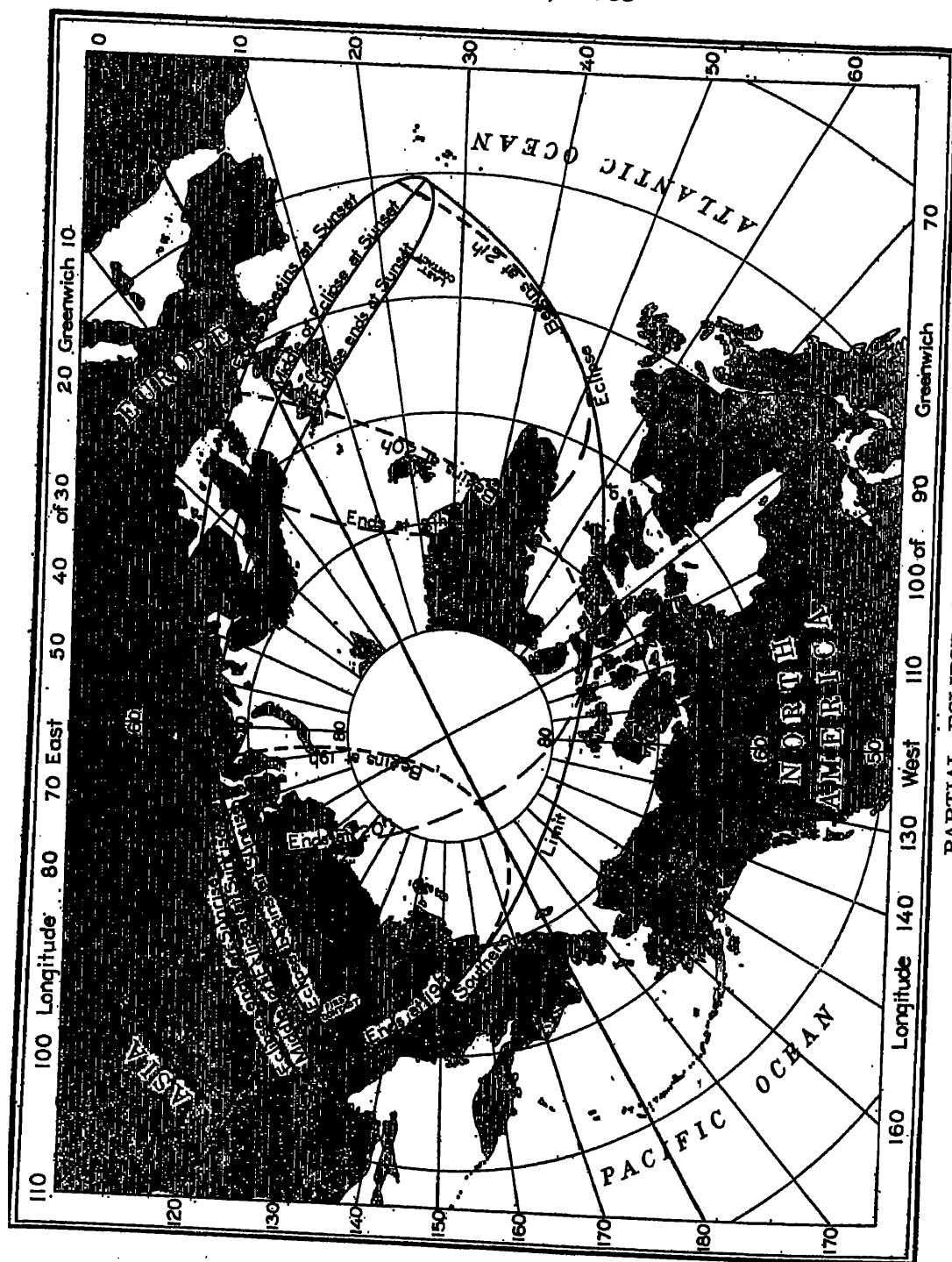
	G.M.T.	Longitude	Latitude
Eclipse begins	... June 30 ^d 18 ^h 34.0 ^m	—124 35'	+59 56'
Greatest eclipse	... 30 19 59.3	— 39 18	+65 14
Eclipse ends	... 30 21 24.9	+ 23 19	+46 43

Magnitude of greatest eclipse 0.338 (Sun's diameter = 1.0)

Place	Mag.	Begins	P	V	Greatest Phase
Armagh ...	0.23	June 30 ^d 20 ^h 07 ^m	333	301	20 42
Dublin ...	0.22	30 20 09	334	301	20 43
Glasgow ...	0.24	30 20 03	331	301	20 38
Edinburgh ...	0.25	30 20 02	331	300	20 38
Liverpool ...	0.23	30 20 06	332	300	20 41
Durham ...	0.25	30 20 02	331	300	20 38
Oxford ...	0.19*	30 20 08	333	300	...
Greenwich ...	0.14*	30 20 07	332	300	...
Cambridge ...	0.18*	30 20 06	332	300	...

* Magnitude at Sunset

ECLIPSES, 1935



PARTIAL ECLIPSE OF JUNE 30

ECLIPSES, 1935

529

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN, JUNE 30

Green- wich Mean Time	Co-ordinates of Centre of Shadow on Fundamental Plane		Direction of Axis of Shadow			Radius of Penumbra on Funda- mental Plane
	x	y	$\sin d$	$\cos d$	μ	l_1
^h 18 ^m 30	-0.56073	+1.46687	+0.39398	+0.91912	96° 39.5	+0.55567
40	0.47417	1.45332	0.39397	0.91912	99 09.5	0.55569
50	0.38762	1.43975	0.39396	0.91912	101 39.5	0.55572
19 00	-0.30107	+1.42617	+0.39396	+0.91913	104 09.4	+0.55574
10	0.21452	1.41258	0.39395	0.91913	106 39.4	0.55576
20	0.12797	1.39898	0.39395	0.91914	109 09.4	0.55578
30	-0.04143	1.38537	0.39394	0.91914	111 39.4	0.55580
40	+0.04512	1.37174	0.39393	0.91914	114 09.4	0.55582
50	0.13166	1.35811	0.39393	0.91914	116 39.4	0.55583
20 00	+0.21820	+1.34446	+0.39392	+0.91914	119 09.4	+0.55585
10	0.30473	1.33080	0.39391	0.91915	121 39.4	0.55587
20	0.39127	1.31713	0.39391	0.91915	124 09.4	0.55588
30	0.47780	1.30344	0.39390	0.91915	126 39.4	0.55590
40	0.56432	1.28975	0.39389	0.91916	129 09.4	0.55591
50	0.65084	1.27604	0.39389	0.91916	131 39.4	0.55593
21 00	+0.73736	+1.26232	+0.39389	+0.91916	134 09.4	+0.55594
10	0.82388	1.24860	0.39388	0.91916	136 39.4	0.55595
20	0.91039	1.23486	0.39388	0.91916	139 09.3	0.55597
30	+0.99690	+1.22110	+0.39387	+0.91917	141 39.3	+0.55598

$$\tan f_1 = 0.00460$$

$$\xi' = 0.004363 \rho \cos \phi' \cos (\mu - \lambda)$$

$$\eta' = 0.001719\xi$$

ECLIPSES, 1935

V—*A Total Eclipse of the Moon*, July 16, the beginning visible at Greenwich; the beginning visible generally in Africa, except the extreme north-eastern part, south-western Europe, the Atlantic Ocean, North America, except the north-western part, South America, and the eastern part of the Pacific Ocean; the ending visible generally in the Atlantic Ocean, North America, except the extreme northern part, South America, and the eastern part of the Pacific Ocean.

ELEMENTS OF THE ECLIPSE

G.M.T. of opposition in right ascension	July 16	^d 05	^h 01	^m 32.4
Sun's right ascension	7	38	13.82
Hourly motion	10.11
Moon's right ascension	19	38	13.82
Hourly motion	152.37
Sun's declination	+21	31	47.2
Hourly motion	—	...	23.6
Moon's declination	—21	27	36.0
Hourly motion	+	9	22.2
Sun's equatorial horizontal parallax	8.7
Sun's true semidiameter	15	44.1
Moon's equatorial horizontal parallax	60	08.2
Moon's true semidiameter	16	22.4

CIRCUMSTANCES OF THE ECLIPSE

Moon enters penumbra ... ..	...	...	...	July 16	^d 02	^h 15.3
Moon enters umbra ... ..	...	...	...	16	03	11.8
Total eclipse begins ... ..	...	...	...	16	04	09.4
Middle of the eclipse ... ..	...	...	...	16	04	59.6
Total eclipse ends ... ..	...	...	...	16	05	49.7
Moon leaves umbra ... ..	...	...	...	16	06	47.1
Moon leaves penumbra ... ..	...	...	...	16	07	43.1

Contact of umbra with Moon's limb	Position angle	The Moon being in the zenith in Longitude	Latitude
First	79°	+47 35	—21 44
Last	251	+99 18	—21 11

Magnitude of the eclipse 1.761 (Moon's diameter = 1.0)

ECLIPSES, 1935

531

VI—A *Partial Eclipse of the Sun*, July 30, invisible at Greenwich.

ELEMENTS OF THE ECLIPSE

G.M.T. of conjunction in right ascension	July 30	^d	^h	^m	^s
				16	43.3
Sun and Moon's right ascension	...	...	8	34	49.51
Sun's hourly motion	...	...	...	...	9.78
Moon's hourly motion	...	...	...	...	119.56
Sun's declination	...	...	...	+18°	41' 59.4"
Hourly motion	...	...	...	—	35.7"
Moon's declination	...	...	...	+17°	19' 23.1"
Hourly motion	...	...	...	—	10' 06.5"
Sun's equatorial horizontal parallax	...	...	...	...	8.7"
Sun's true semidiameter	...	...	...	15	45.2
Moon's equatorial horizontal parallax	...	...	...	54	34.6
Moon's true semidiameter	...	...	...	14	51.6

CIRCUMSTANCES OF THE ECLIPSE

	G.M.T.	Longitude	Latitude
Eclipse begins	July 30 ^d 08 ^h 01.8 ^m	+10° 20'	−43° 10'
Greatest eclipse	30 09 16.0	+ 5 49	−62 58
Eclipse ends	30 10 29.9	−35 58	−70 55

Magnitude of greatest eclipse 0.231 (Sun's diameter = 1.0)

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN,
JULY 30

Green- wich Mean Time	Co-ordinates of Centre of Shadow on Fundamental Plane		Direction of Axis of Shadow			Radius of Penumbra on Funda- mental Plane
	x	y	$\sin d$	$\cos d$	μ	l_1
8 ^h 00 ^m	-1.09703	-1.11876	+0.32103	+0.94707	298° 25.0'	+0.56219
10	1.01678	1.14790	0.32100	0.94708	300 55.0	0.56221
20	0.93654	1.17704	0.32097	0.94709	303 25.0	0.56222
30	0.85630	1.20619	0.32095	0.94710	305 55.0	0.56223
40	0.77605	1.23534	0.32092	0.94711	308 25.0	0.56225
50	0.69581	1.26450	0.32090	0.94712	310 55.1	0.56226
9 00	-0.61557	-1.29366	+0.32087	+0.94713	313 25.1	+0.56227
10	0.53533	1.32282	0.32085	0.94714	315 55.1	0.56229
20	0.45509	1.35199	0.32082	0.94714	318 25.1	0.56230
30	0.37485	1.38116	0.32079	0.94715	320 55.1	0.56231
40	0.29461	1.41033	0.32077	0.94716	323 25.1	0.56232
50	0.21438	1.43950	0.32074	0.94717	325 55.2	0.56233
10 00	-0.13415	-1.46868	+0.32072	+0.94718	328 25.2	+0.56234
10	-0.05392	1.49786	0.32069	0.94719	330 55.2	0.56235
20	+0.02631	1.52704	0.32066	0.94720	333 25.2	0.56236
30	+0.10653	-1.55623	+0.32063	+0.94721	335 55.2	+0.56236

$$\tan f_1 = 0.00461$$

$$\xi' = 0.004364 p \cos \phi' \cos (\mu - \lambda)$$

$$\eta' = 0.001400 \xi$$

VII—*An Annular Eclipse of the Sun*, December 25, invisible at Greenwich.

ELEMENTS OF THE ECLIPSE

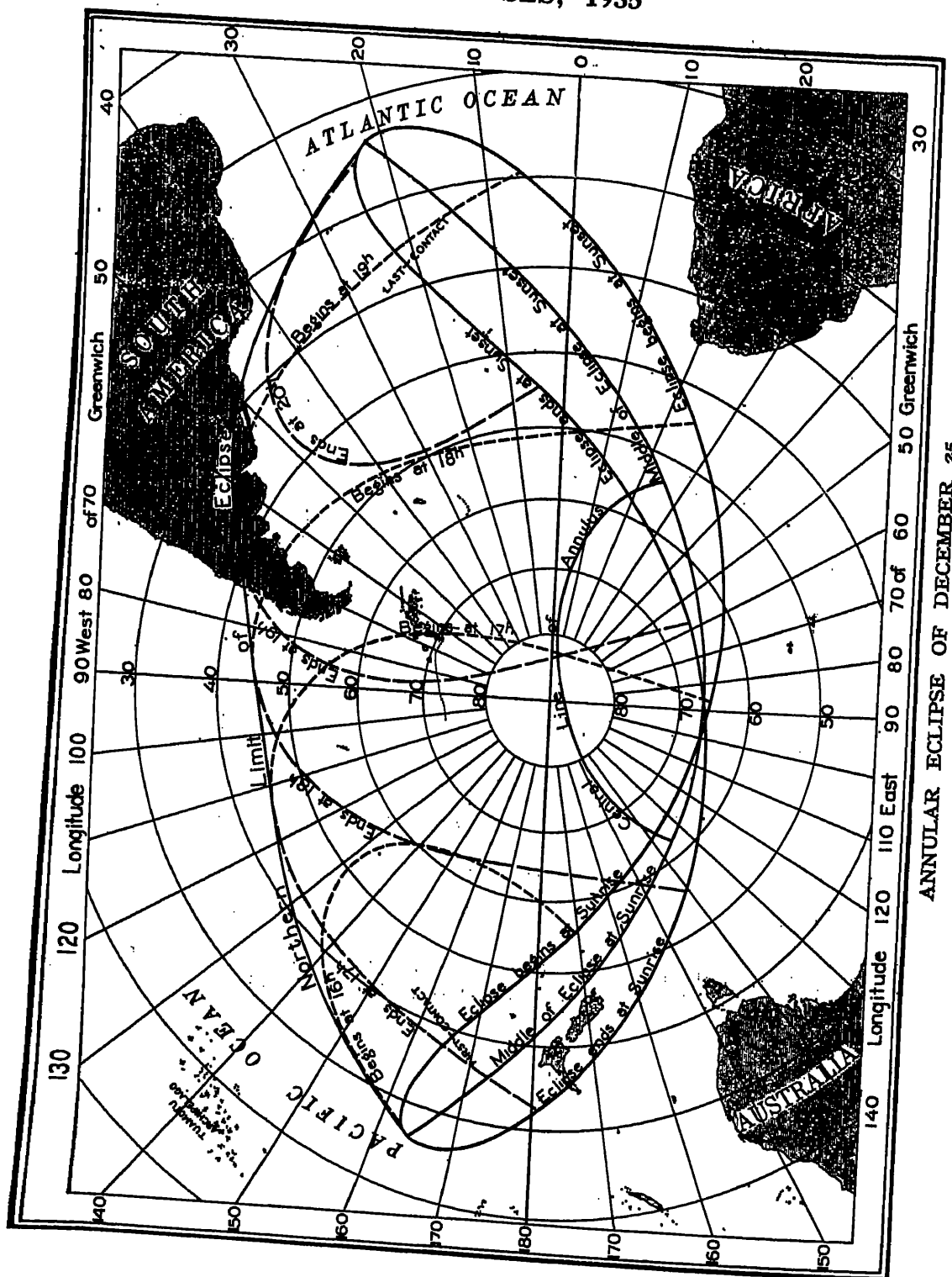
G.M.T. of conjunction in right ascension	Dec. 25	^d 17	^h 46	^m 58.1
Sun and Moon's right ascension	...	...	18 13	10.52
Sun's hourly motion	...	...	...	11.11
Moon's hourly motion	...	...	...	148.38
Sun's declination	...	...	...	-23° 24' 48".4
Hourly motion	...	...	...	+ 3.5
Moon's declination	...	...	...	-24 18 28.4
Hourly motion	...	...	...	+ 3 51.4
Sun's equatorial horizontal parallax	...	...	...	8.9
Sun's true semidiameter	...	...	...	16 15.8
Moon's equatorial horizontal parallax	...	...	...	57 52.4
Moon's true semidiameter	...	...	...	15 45.4

CIRCUMSTANCES OF THE ECLIPSE

	G.M.T.			Longitude		Latitude	
Eclipse begins	Dec. 25	^d 15	^h 41.9	+166°	11'	-39°	12'
Central eclipse begins	25	17	17.8	-134	59	-62	18
Central eclipse at local apparent midnight	25	17	47.0	- 93	14	-87	43
Central eclipse ends	25	18	41.1	- 25	06	-53	14
Eclipse ends	25	20	16.8	+ 21	31	-26	55

At Wellington the magnitude of the eclipse is 0.44 at sunrise. It ends at 17^h 20^m, the angle of last contact from the north point being 120°, and from the vertex 253°.

ECLIPSES, 1935



ECLIPSES, 1935

535

BESELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, DECEMBER 25

Green- wich Mean Time	Co-ordinates of Centre of Shadow on Fundamental Plane		Direction of Axis of Shadow			Radius of Penumbra and Umbra on Fundamental Plane		
	<i>x</i>	<i>y</i>	<i>sin d</i>	<i>cos d</i>	<i>μ</i>	<i>l</i> ₁	<i>l</i> ₂	
^h ^m					[°] [']			
15	40	-1.14656	-1.06887	-0.39736	+0.91766	55 01.4	+0.55489	+0.00893
	50	1.05627	1.05798	0.39736	0.91766	57 31.4	0.55488	0.00892
16	00	-0.96597	-1.04708	-0.39735	+0.91766	60 01.4	+0.55487	+0.00891
	10	0.87567	1.03617	0.39735	0.91766	62 31.3	0.55486	0.00889
	20	0.78537	1.02525	0.39735	0.91767	65 01.3	0.55484	0.00888
	30	0.69507	1.01431	0.39734	0.91767	67 31.3	0.55483	0.00887
	40	0.60477	1.00336	0.39734	0.91767	70 01.2	0.55481	0.00885
	50	0.51446	0.99240	0.39734	0.91767	72 31.2	0.55480	0.00884
17	00	-0.42416	-0.98143	-0.39734	+0.91767	75 01.2	+0.55478	+0.00882
	10	0.33385	0.97044	0.39733	0.91767	77 31.1	0.55477	0.00880
	20	0.24355	0.95944	0.39733	0.91768	80 01.1	0.55475	0.00879
	30	0.15324	0.94844	0.39733	0.91768	82 31.0	0.55473	0.00877
	40	-0.06293	0.93741	0.39733	0.91768	85 01.0	0.55471	0.00875
	50	+0.02738	0.92638	0.39732	0.91768	87 31.0	0.55469	0.00873
18	00	+0.11768	-0.91533	-0.39732	+0.91768	90 00.9	+0.55467	+0.00871
	10	0.20799	0.90428	0.39732	0.91768	92 30.9	0.55465	0.00869
	20	0.29830	0.89321	0.39732	0.91768	95 00.8	0.55463	0.00867
	30	0.38860	0.88213	0.39732	0.91769	97 30.8	0.55461	0.00865
	40	0.47890	0.87103	0.39731	0.91769	100 00.8	0.55459	0.00863
	50	0.56921	0.85993	0.39731	0.91769	102 30.7	0.55456	0.00860
19	00	+0.65951	-0.84881	-0.39731	+0.91769	105 00.7	+0.55454	+0.00858
	10	0.74981	0.83768	0.39731	0.91769	107 30.7	0.55452	0.00856
	20	0.84011	0.82655	0.39730	0.91769	110 00.6	0.55449	0.00853
	30	0.93041	0.81540	0.39730	0.91770	112 30.6	0.55446	0.00850
	40	1.02070	0.80423	0.39730	0.91770	115 00.6	0.55444	0.00848
	50	1.11099	0.79306	0.39730	0.91770	117 30.5	0.55441	0.00845
20	00	+1.20128	-0.78188	-0.39730	+0.91770	120 00.5	+0.55438	+0.00842
	10	1.29157	0.77068	0.39729	0.91770	122 30.4	0.55436	0.00840
	20	+1.38185	-0.75947	-0.39729	+0.91770	125 00.4	+0.55433	+0.00837

$$\tan f_1 = 0.00475 \quad \tan f_2 = 0.00473 \quad \xi = 0.004362 \quad \rho \cos \phi' \cos (\mu - \lambda) \quad \eta' = -0.001733\xi$$

536 MEAN PLACES OF OCCULTATION STARS, 1935

MEAN PLACES FOR 1935.0 (January 1st 290, Greenwich Mean Time)

Name of Star	Mag.	Right Ascension	Declination	Name of Star	Mag.	Right Ascension	Declination
36 Piscium	6.2	^{h m s} 0 13 13.51	^{° ' "} + 7 52 46.4	5 Gem.	5.9	^{h m s} 6 07 33.20	^{° ' "} +24 26 10.3
136 B. Piscium	6.5	0 37 50.23	9 00 02.8	8 Gem.	6.1	6 12 20.77	23 59 33.0
75 Piscium	6.2	1 03 08.28	12 36 29.8	9 Gem.	6.3	6 13 00.82	23 45 52.4
101 Piscium	6.2	1 32 17.74	14 19 47.4	36 B. Gem.	6.0	6 21 35.94	23 21 54.6
105 Piscium	6.1	1 36 10.15	16 04 36.4	52 B. Gem.	6.4	6 33 28.17	24 38 46.8
3 Arietis	6.5	1 43 03.32	+17 05 17.1	87 B. Gem.	5.8	6 48 03.41	+23 40 48.3
4 Arietis	5.7	1 44 39.14	16 37 58.0	37 Gem.	5.8	6 51 18.92	25 27 31.0
1 Arietis	5.2	1 53 47.72	17 30 03.2	∞ Gem.	5.2	6 58 27.27	24 18 35.3
35 B. Arietis	6.4	2 00 08.44	17 56 30.0	44 Gem.	5.9	7 01 23.69	22 44 10.9
47 B. Arietis	6.5	2 04 11.47	17 43 13.6	120 B. Gem.	6.5	7 06 15.60	21 21 43.8
20 H. Arietis	6.4	2 05 48.65	+16 55 13.0	48 Gem.	5.8	7 08 29.56	+24 14 20.7
15 Arietis	5.9	2 07 01.13	19 11 39.7	58 Gem.	6.0	7 19 33.88	23 04 18.4
26 Arietis	6.1	2 26 59.40	19 34 04.6	149 B. Gem.	6.4	7 22 59.93	21 40 01.7
1 Arietis	5.4	2 35 07.28	21 40 52.7	63 Gem.	5.3	7 23 53.03	21 34 47.8
μ Arietis	5.7	2 38 41.81	19 44 08.4	B.D. +23° 17' 44"	6.4	7 28 57.07	23 01 40.0
47 Arietis	5.8	2 54 21.70	+20 24 33.7	187 B. Gem.	6.2	7 37 05.28	+23 10 15.0
64 Arietis	5.7	3 20 27.88	24 29 42.6	192 B. Gem.	6.3	7 39 30.10	22 33 15.6
66 Arietis	6.1	3 24 38.36	22 34 52.3	79 Gem.	6.3	7 41 20.49	20 28 24.6
7 Tauri	5.9	3 30 35.43	24 14 52.0	209 B. Gem.	6.1	7 48 10.12	19 29 35.0
16 Tauri	5.4	3 40 56.09	24 05 10.7	85 Gem.	5.4	7 51 52.46	20 03 25.2
18 Tauri	5.6	3 41 16.72	+24 38 12.7	217 B. Gem.	6.3	7 57 00.81	+19 59 45.1
9 Tauri	4.4	3 41 20.02	24 15 53.8	10 H. Cancrī	6.1	8 01 00.04	19 01 36.7
20 Tauri	4.0	3 41 57.28	24 09 57.8	1 st Cancrī	5.1	8 08 29.22	17 50 43.3
21 Tauri	5.8	3 42 01.84	24 21 10.9	2 nd Cancrī	6.2	8 22 09.32	17 15 42.5
22 Tauri	6.5	3 42 10.26	24 19 35.6	3 rd Cancrī	5.6	8 27 53.56	18 18 54.6
23 Tauri	4.2	3 42 27.84	+23 44 49.7	8 Cancrī	4.2	8 40 59.68	+18 23 39.6
104 B. Tauri	5.5	3 44 29.65	23 13 22.6	54 Cancrī	6.3	8 47 24.45	15 35 34.7
27 Tauri	3.8	3 45 17.58	23 51 21.8	0 ¹ Cancrī	5.2	8 53 37.60	15 34 23.6
28 Tauri	5.2	3 45 18.89	23 56 22.4	0 ² Cancrī	5.6	8 53 57.57	15 49 55.5
14 H. Tauri	5.4	3 46 24.22	25 23 05.4	81 Cancrī	6.4	9 08 44.35	15 15 32.8
33 Tauri	6.0	3 53 12.50	+22 59 18.1	∞ Cancrī	5.6	9 11 38.77	+15 12 44.1
161 B. Tauri	6.5	3 57 05.22	23 01 08.4	R Leonis	5-10	9 44 03.87	11 43 52.7
36 Tauri	5.7	4 00 28.19	23 55 41.9	83 B. Leonis	5.9	9 52 59.27	9 14 31.3
ρ Tauri	5.6	4 06 52.10	26 18 46.0	89 B. Leonis	6.3	9 54 41.17	8 37 30.1
χ Tauri	5.4	4 18 37.46	25 28 38.4	43 Leonis	6.3	10 19 36.46	6 52 24.0
62 Tauri	6.2	4 20 04.44	+24 09 03.6	155 B. Leonis	6.5	10 19 52.11	+ 6 01 28.5
315 B. Tauri	6.3	4 52 17.98	24 29 23.2	35 Sext.	6.0	10 39 58.60	5 05 22.1
h Tauri	5.6	4 54 10.60	24 57 05.2	p ¹ Leonis	6.2	11 00 16.99	0 20 58.7
103 Tauri	5.5	5 04 08.86	24 10 50.4	p ² Leonis	5.7	11 03 35.34	2 18 32.1
118 Tauri	5.4	5 25 16.44	25 05 58.0	p ³ Leonis	5.4	11 10 25.95	0 17 03.9
112 B. Anrigæ	5.7	5 33 05.12	+26 53 06.6	359 B. Leonis	6.3	11 19 58.28	+ 0 29 20.8
125 Tauri	5.0	5 35 42.48	25 51 44.3	388 B. Leonis	6.3	11 24 34.43	- 1 20 30.7
132 Tauri	5.0	5 45 01.58	24 32 50.8	s Leonis	5.1	11 26 59.64	2 38 40.0
412 B. Tauri	6.0	5 52 57.29	24 14 30.9	431 B. Leonis	6.2	11 35 04.75	2 04 34.8
139 Tauri	4.9	5 53 57.65	+25 56 51.2	13 B. Virginis	5.8	11 47 42.87	- 4 58 17.9

MEAN PLACES OF OCCULTATION STARS, 1935 537

MEAN PLACES FOR 1935.0 (January 1st 290, Greenwich Mean Time)

Name of Star	Mag.	Right Ascension	Declination	Name of Star	Mag.	Right Ascension	Declination
78 B. Virginis	6.5	^h 12 ^m 10 ^s 55.64	- 5 21 26.0	68 G. Sag.	6.2	^h 18 ^m 23 ^s 40.64	-26 40 30.3
7 Virginis	5.4	12 30 25.34	9 05 36.8	86 B. Sag.	6.5	18 24 53.94	26 37 31.1
370 B. Virginis	6.0	12 50 55.68	11 17 48.4	24 Sag.	5.7	18 29 55.25	24 04 57.4
69 Virginis	4.9	13 23 58.92	15 38 13.6	117 B. Sag.	5.8	18 34 33.45	23 33 43.2
75 Virginis	5.6	13 29 23.07	15 01 44.6	26 Sag.	6.1	18 37 53.78	23 53 44.0
83 Virginis	5.7	13 40 59.15	-15 51 10.3	126 B. Sag.	5.8	18 40 49.83	-25 04 41.3
85 Virginis	6.2	13 42 04.87	15 26 29.7	^μ Sag.	5.0	18 50 14.77	22 49 35.8
87 Virginis	5.8	13 43 52.89	17 32 06.8	^μ Sag.	5.0	18 51 11.40	22 45 14.8
43 H. Virginis	5.6	14 11 48.92	17 53 53.6	154 B. Sag.	5.9	18 52 04.53	23 15 29.9
231 G. Virginis	6.4	14 13 27.91	18 17 00.0	162 B. Sag.	6.6	18 54 21.39	24 57 55.1
236 G. Virginis	5.7	14 15 02.37	-18 24 54.9	127 G. Sag.	6.4	18 56 25.50	-25 02 02.5
9 G. Libræ	6.5	14 31 11.12	20 09 18.0	168 B. Sag.	6.3	18 57 42.72	22 47 18.2
17 G. Libræ	6.4	14 42 29.39	20 54 05.4	172 B. Sag.	5.7	18 58 29.20	24 56 16.7
18 G. Libræ	6.1	14 43 31.57	21 03 11.9	189 B. Sag.	6.2	19 04 16.38	24 45 37.3
43 B. Libræ	5.8	14 53 39.96	21 07 27.4	191 B. Sag.	6.5	19 04 48.88	23 17 41.1
47 G. Libræ	6.1	15 02 41.93	-21 46 48.0	199 B. Sag.	6.4	19 08 34.96	-21 46 04.9
64 G. Libræ	5.7	15 12 36.64	22 09 35.5	222 B. Sag.	5.6	19 16 44.46	22 31 30.3
153 B. Libræ	6.3	15 29 17.96	24 16 11.8	50 Sag.	5.6	19 22 26.61	21 54 24.6
169 B. Libræ	5.8	15 33 58.51	22 55 37.4	253 B. Sag.	6.0	19 27 02.73	21 26 56.3
42 Libræ	5.1	15 36 26.03	23 36 29.7	57 Sag.	6.0	19 48 25.49	19 12 41.3
b Scorpii	4.8	15 47 03.84	-25 33 19.1	σ Cap.	5.5	20 15 38.71	-19 19 21.7
A Scorpii	4.7	15 49 42.28	25 08 03.6	π Cap.	5.2	20 23 36.14	18 25 33.4
31 B. Scorpii	5.4	15 50 00.60	24 20 27.6	12 Cap.	6.1	20 26 10.46	18 47 58.6
32 B. Scorpii	5.4	15 50 03.44	23 47 08.0	47 B. Cap.	6.2	20 31 51.69	16 45 01.7
3 Scorpii	5.9	15 50 45.00	25 03 08.7	61 B. Cap.	5.9	20 36 53.62	16 21 23.5
40 B. Scorpii	5.4	15 54 40.63	-24 38 41.9	81 B. Cap.	6.4	20 45 39.46	-18 16 36.0
48 B. Scorpii	5.1	15 59 24.70	25 41 08.0	94 B. Cap.	6.0	20 54 02.52	16 16 56.6
50 B. Scorpii	6.4	16 00 00.36	24 32 55.6	95 B. Cap.	6.0	20 55 06.18	14 44 06.3
24 G. Scorpii	6.2	16 03 57.62	24 17 24.1	53 B. Aquarii	6.5	21 12 26.12	13 28 21.5
65 B. Scorpii	5.6	16 04 09.76	26 09 12.4	18 Aquarii	5.5	21 20 38.47	13 09 29.3
41 G. Scorpii	6.3	16 09 50.74	-24 15 26.8	72 B. Aquarii	6.5	21 24 42.53	-11 51 01.3
85 B. Scorpii	6.2	16 10 56.86	25 18 47.1	137 B. Cap.	6.2	21 35 58.56	10 52 11.6
22 Scorpii	4.9	16 26 15.32	24 58 24.4	c ¹ Cap.	5.3	21 41 32.41	9 22 54.0
116 B. Scorpii	6.2	16 27 23.32	26 23 51.7	c ² Cap.	6.2	21 42 48.30	9 34 36.7
118 B. Oph.	6.2	17 02 51.37	26 25 37.4	λ Cap.	5.4	21 43 02.28	11 39 59.5
137 B. Oph.	6.3	17 08 14.36	-25 10 35.2	96 B. Aquarii	6.5	21 50 07.59	-10 37 06.4
36 Oph.	5.3	17 11 20.81	26 30 33.8	44 Aquarii	5.8	22 13 42.98	5 42 44.5
136 G. Oph.	6.3	17 22 53.86	25 53 14.2	ρ Aquarii	5.4	22 16 46.81	8 08 54.2
151 G. Oph.	6.0	17 27 42.20	26 13 17.2	170 B. Aquarii	6.1	22 20 07.78	7 31 24.2
4 G. Sag.	6.2	17 44 23.87	26 57 13.5	186 B. Aquarii	6.2	22 27 53.96	6 53 15.9
63 Oph.	6.1	17 50 54.05	-24 52 33.4	207 B. Aquarii	6.4	22 37 26.22	- 3 53 32.7
7 Sag.	5.5	17 58 52.04	24 17 00.0	6 G. Piscium	6.2	22 54 54.77	2 44 39.6
9 Sag.	5.9	17 59 53.23	24 21 49.5	22 B. Piscium	6.5	23 20 11.86	- 0 03 55.7
1 Sag.	5.1	18 07 45.39	23 42 58.6	9 Piscium	6.4	23 23 55.02	+ 0 45 55.5
67 B. Sag.	6.4	18 14 40.12	25 37 51.9	16 Piscium	5.6	23 33 04.24	1 44 28.7
70 B. Sag.	6.4	18 17 31.34	-24 56 46.3	19 Piscium	5.3	23 43 04.12	+ 3 07 34.1

538 REDUCTIONS OF OCCULTATION STARS, 1935

REDUCTIONS FROM 1935.0 TO APPARENT PLACE

No.	$\Delta\alpha$	$\Delta\delta$	No.	$\Delta\alpha$	$\Delta\delta$	No.	$\Delta\alpha$	$\Delta\delta$	No.	$\Delta\alpha$	$\Delta\delta$
1	-0.04	- 2.3	49	+1.06	- 6.6	97	+2.46	-15.6	145	+2.32	+ 3.4
2	0.13	2.4	50	1.02	6.2	98	2.40	15.0	146	2.39	2.8
3	0.16	2.5	51	0.83	4.8	99	2.34	14.7	147	2.47	+ 1.4
4	-0.21	2.8	52	0.82	5.2	100	2.25	13.5	148	2.55	- 0.3
5	+0.05	1.8	53	0.80	5.1	101	2.24	13.6	149	2.62	3.0
6	+0.13	- 0.7	54	+0.78	- 4.7	102	+2.20	-13.5	150	+2.76	- 6.4
7	0.15	0.4	55	0.78	5.1	103	2.10	12.2	151	2.75	7.9
8	0.18	- 0.1	56	0.76	4.5	104	2.10	12.2	152	2.75	7.8
9	0.39	+ 3.0	57	0.70	4.7	105	2.02	10.9	153	2.78	8.8
10	0.44	3.9	58	0.67	4.4	106	2.01	10.8	154	2.80	9.1
11	+0.63	+ 6.8	59	+0.46	- 4.3	107	+1.99	-10.9	155	+2.82	-14.5
12	0.77	7.6	60	0.40	3.9	108	1.95	10.2	156	2.79	17.3
13	1.16	11.1	61	0.28	4.1	109	1.82	8.8	157	2.76	15.2
14	1.17	10.9	62	0.24	4.0	110	1.78	7.9	158	2.74	14.6
15	1.23	11.2	63	0.21	- 3.9	111	1.77	8.2	159	2.71	13.7
16	+1.27	+11.4	64	+0.23	+ 1.5	112	+1.78	- 7.9	160	+2.69	-13.2
17	1.30	11.2	65	0.26	2.2	113	1.75	8.0	161	2.68	11.9
18	1.32	11.8	66	0.28	2.8	114	1.74	7.5	162	2.65	11.8
19	1.45	11.7	67	0.72	8.4	115	1.73	7.9	163	2.65	10.8
20	1.51	12.4	68	0.88	9.4	116	1.73	7.2	164	2.62	11.0
21	+1.83	+12.3	69	+0.91	+ 9.6	117	+1.69	- 7.3	165	+2.61	-11.1
22	1.90	11.9	70	0.94	9.6	118	1.66	7.1	166	2.61	10.7
23	1.96	11.5	71	1.61	10.9	119	1.64	6.6	167	2.61	10.1
24	1.96	11.5	72	1.61	10.8	120	1.62	7.0	168	2.59	10.5
25	1.97	11.7	73	1.61	11.1	121	1.43	5.4	169	2.55	9.4
26	+1.96	+11.5	74	+1.61	+11.0	122	+1.29	- 4.2	170	+2.54	- 8.7
27	1.97	11.5	75	1.62	10.9	123	1.14	3.8	171	2.53	8.6
28	1.97	11.5	76	1.62	11.0	124	1.11	3.2	172	2.30	5.9
29	1.97	11.5	77	1.62	11.0	125	1.10	3.2	173	2.22	4.4
30	1.97	11.4	78	1.62	10.8	126	1.02	3.3	174	2.03	3.5
31	+1.97	+11.4	79	+1.62	+10.8	127	+0.97	- 3.0	175	+2.00	- 3.0
32	1.98	11.3	80	1.64	10.7	128	0.96	2.9	176	1.84	1.7
33	1.98	11.3	81	1.64	10.7	129	0.93	- 2.8	177	1.83	1.6
34	2.01	11.7	82	1.66	11.2	130	0.37	+ 5.2	178	1.82	1.5
35	2.20	10.4	83	1.81	11.0	131	0.45	6.2	179	1.79	- 1.3
36	+2.58	+ 6.4	84	+1.88	+10.3	132	+0.58	+ 7.5	180	+1.35	0.0
37	2.65	5.3	85	2.39	7.4	133	0.61	7.9	181	1.30	0.0
38	2.77	+ 2.1	86	2.38	6.9	134	0.71	8.2	182	1.29	+ 0.2
39	2.68	- 6.5	87	2.66	3.0	135	1.13	9.9	183	1.19	0.8
40	2.46	9.6	88	2.76	2.0	136	1.15	9.5	184	1.13	0.6
41	+2.30	-10.5	89	+2.76	+ 1.3	137	+1.16	+ 9.6	185	+0.85	+ 1.0
42	2.11	11.2	90	2.81	- 0.5	138	1.16	9.5	186	0.80	7.8
43	2.03	11.2	91	2.84	1.2	139	1.16	9.6	187	0.80	7.7
44	2.00	10.9	92	2.87	1.7	140	1.16	9.6	188	0.80	7.9
45	1.96	10.9	93	2.88	6.1	141	1.19	9.9	189	0.80	7.7
46	+1.70	- 9.9	94	+2.86	- 8.2	142	+1.41	+ 9.4	190	+0.81	+ 7.7
47	1.61	9.5	95	2.61	15.0	143	1.94	7.0	191	0.82	7.7
48	+1.38	- 8.4	96	+2.55	-15.4	144	+2.06	+ 6.2	192	+0.82	+ 7.8

REDUCTIONS OF OCCULTATION STARS, 1935 539

REDUCTIONS FROM 1935.0 TO APPARENT PLACE

No.	$\Delta\alpha$	$\Delta\delta$	No.	$\Delta\alpha$	$\Delta\delta$	No.	$\Delta\alpha$	$\Delta\delta$	No.	$\Delta\alpha$	$\Delta\delta$
193	+1.19	+ 7.1	241	+0.93	+ 4.7	289	+1.66	+ 9.0	337	+2.94	+14.9
194	1.45	6.3	242	1.09	5.3	290	1.49	8.3	338	2.81	15.1
195	1.56	5.8	243	...	...	291	1.17	7.1	339	2.66	15.1
196	1.78	3.7	244	1.23	4.8	292	1.43	0.7	340	2.64	14.8
197	1.86	2.7	245	1.44	3.2	293	1.43	+ 0.2	341	2.52	14.5
198	+1.98	+ 1.9	246	+1.59	+ 0.9	294	+1.48	- 0.7	342	+2.23	+13.2
199	2.03	0.9	247	1.62	1.0	295	1.53	1.9	343	2.13	12.2
200	2.08	+ 0.4	248	1.61	0.5	296	1.60	2.8	344	1.94	10.4
201	2.14	- 0.3	249	1.62	0.4	297	1.63	3.2	345	1.90	10.3
202	2.16	1.9	250	1.71	+ 0.1	298	1.68	4.7	346	1.87	9.6
203	+2.28	- 4.0	251	+1.74	- 1.3	299	+1.85	- 8.6	347	+1.83	+ 9.4
204	2.40	6.9	252	1.77	1.6	300	2.01	11.7	348	1.75	8.6
205	2.40	6.8	253	1.87	3.2	301	2.37	16.7	349	1.68	7.7
206	2.45	7.8	254	1.97	5.5	302	2.43	18.0	350	1.66	7.0
207	2.56	12.1	255	2.20	9.6	303	2.81	20.4	351	1.62	+ 6.7
208	+2.64	-14.0	256	+2.22	-10.9	304	+3.07	-20.9	352	+1.56	- 3.1
209	2.69	15.4	257	2.22	11.2	305	3.15	20.8	353	1.60	4.3
210	2.74	16.9	258	2.23	11.4	306	3.38	20.2	354	1.74	8.7
211	2.75	17.6	259	2.32	12.9	307	3.38	20.3	355	1.82	10.1
212	2.78	17.8	260	2.31	13.2	308	3.51	19.9	356	1.80	10.4
213	+2.78	-18.3	261	+2.41	-14.2	309	+3.58	-19.5	357	+2.06	-14.6
214	2.81	18.6	262	2.50	16.0	310	3.59	19.5	358	2.06	15.0
215	2.94	20.3	263	2.62	18.1	311	3.69	19.7	359	2.42	18.2
216	3.31	14.4	264	2.79	19.5	312	3.72	18.5	360	2.55	19.0
217	3.29	14.4	265	2.88	20.6	313	3.77	17.9	361	2.83	19.8
218	+3.30	-14.1	266	+3.84	-12.4	314	+3.90	-17.1	362	+2.93	-19.9
219	3.32	13.0	267	3.87	11.7	315	3.92	16.5	363	2.96	20.4
220	3.29	13.2	268	3.87	8.1	316	4.02	15.6	364	3.19	19.6
221	3.32	12.9	269	3.72	1.8	317	4.00	15.5	365	3.34	19.6
222	3.30	12.4	270	3.72	1.2	318	3.99	15.4	366	3.55	19.6
223	+3.29	-12.2	271	+3.63	- 0.2	319	+4.03	-15.1	367	+3.59	-18.4
224	3.30	11.6	272	3.56	+ 0.9	320	4.08	14.9	368	3.82	17.4
225	3.29	11.1	273	3.51	2.0	321	4.14	13.3	369	3.98	16.0
226	3.30	10.4	274	3.44	2.9	322	4.20	12.6	370	3.96	15.8
227	3.27	10.6	275	3.02	7.0	323	4.16	12.4	371	3.95	15.6
228	+3.30	-10.2	276	+3.00	+ 6.9	324	+4.34	- 0.7	372	+3.98	-16.0
229	3.22	7.7	277	3.02	7.2	325	3.82	+10.2	373	4.00	15.5
230	3.18	7.4	278	2.81	8.4	326	3.81	10.2	374	4.06	15.4
231	3.15	6.3	279	2.61	8.9	327	3.82	10.4	375	4.05	14.7
232	3.14	5.9	280	2.45	9.6	328	3.75	10.5	376	4.24	13.3
233	+3.10	- 4.5	281	+2.40	+ 9.6	329	+3.72	+10.9	377	+4.20	-12.9
234	2.95	2.7	282	2.24	9.8	330	3.60	11.9	378	4.25	13.1
235	2.92	2.7	283	2.22	10.0	331	3.45	13.4	379	4.43	9.7
236	2.82	- 1.0	284	2.19	10.0	332	3.40	13.3	380	4.45	9.4
237	2.66	+ 0.1	285	2.08	9.4	333	3.33	13.8	381	4.50	7.4
238	+2.14	+ 3.3	286	+1.78	+ 9.2	334	+3.28	+13.8	382	+4.66	- 0.8
239	1.74	4.4	287	1.72	9.2	335	3.31	14.4	383	4.12	+16.9
240	+1.39	+ 5.1	288	+1.69	+ 9.4	336	+3.05	+15.2	384	+4.02	+17.7

540 REDUCTIONS OF OCCULTATION STARS, 1935

REDUCTIONS FROM 1935.0 TO APPARENT PLACE

No.	$\Delta\alpha$	$\Delta\delta$	No.	$\Delta\alpha$	$\Delta\delta$	No.	$\Delta\alpha$	$\Delta\delta$	No.	$\Delta\alpha$	$\Delta\delta$
385	+4.02	+18.3	433	+4.70	+0.8	481	+3.83	-9.9	529	+4.04	+8.8
386	3.97	18.6	434	4.67	2.4	482	3.87	10.0	530	3.91	6.0
387	3.84	19.6	435	4.67	3.2	483	4.00	7.6	531	3.80	3.2
388	3.82	19.8	436	4.70	3.8	484	4.27	2.8	532	3.69	+2.5
389	3.80	19.9	437	4.70	6.1	485	4.27	2.3	533	3.46	-0.8
390	+3.77	+20.0	438	+4.70	+6.7	486	+4.32	-1.9	534	+3.36	-1.5
391	3.68	19.9	439	4.65	13.4	487	4.31	-0.7	535	3.26	2.5
392	3.60	20.3	440	4.33	22.7	488	4.34	+0.2	536	3.27	3.2
393	3.20	19.1	441	4.07	24.8	489	4.40	0.1	537	3.20	2.9
394	3.10	18.8	442	4.07	24.9	490	4.39	1.9	538	3.21	3.0
395	+2.90	+16.5	443	+4.03	+25.0	491	+4.40	+2.6	539	+3.03	-4.6
396	2.89	15.8	444	4.02	25.1	492	4.45	3.2	540	3.00	5.0
397	2.86	15.5	445	3.90	24.3	493	4.48	4.8	541	2.96	5.0
398	2.83	15.0	446	3.84	23.9	494	4.48	5.5	542	2.66	7.2
399	2.54	9.7	447	3.73	21.4	495	4.49	6.1	543	2.42	8.8
400	+2.50	+9.3	448	+3.71	+21.5	496	+4.58	+11.8	544	+2.54	-15.6
401	2.50	9.4	449	3.72	20.9	497	4.58	12.8	545	2.60	13.8
402	2.48	9.5	450	3.70	20.4	498	4.60	13.0	546	2.84	12.6
403	2.43	+8.6	451	3.66	19.5	499	4.55	14.0	547	2.88	12.6
404	1.95	-14.4	452	3.63	18.4	500	4.59	16.3	548	2.91	12.4
405	+2.49	-18.4	453	+3.60	+17.8	501	+4.54	+18.5	549	+2.97	-11.7
406	2.61	18.2	454	3.56	17.2	502	4.55	19.3	550	3.04	11.7
407	3.01	18.3	455	3.52	15.9	503	4.54	21.4	551	3.35	9.0
408	3.10	18.2	456	3.44	13.7	504	4.50	24.0	552	3.36	8.2
409	3.11	18.2	457	3.38	12.4	505	4.50	24.2	553	3.41	7.4
410	+3.24	-18.8	458	+3.39	+12.1	506	+4.36	+25.7	554	+3.47	-7.3
411	3.28	17.5	459	3.33	11.2	507	4.34	25.7	555	3.51	7.0
412	3.52	16.9	460	3.30	9.5	508	4.36	24.8	556	3.62	4.7
413	3.70	15.8	461	3.01	5.3	509	4.36	24.1	557	3.78	2.9
414	3.68	15.5	462	2.70	+0.3	510	4.35	23.7	558	3.78	2.4
415	+3.70	-15.7	463	+2.61	-0.6	511	+4.34	+23.6	559	+3.83	-2.1
416	3.72	15.2	464	2.50	1.2	512	4.34	23.6	560	3.84	0.3
417	3.76	14.8	465	2.50	1.7	513	4.36	22.6	561	3.87	-0.1
418	3.78	14.5	466	2.51	16.3	514	4.35	21.8	562	3.90	+1.4
419	3.99	13.4	467	2.51	16.4	515	4.33	21.1	563	3.91	1.6
420	+3.96	-12.9	468	+2.64	-16.5	516	+4.32	+19.6	564	+3.92	+1.4
421	4.01	13.3	469	2.72	16.5	517	4.28	17.0	565	3.94	2.2
422	4.25	10.1	470	2.88	16.0	518	4.30	16.1	566	3.99	2.6
423	4.25	9.2	471	2.94	15.6	519	4.27	15.3	567	3.97	3.5
424	4.28	10.0	472	3.10	15.6	520	4.28	15.2	568	4.03	4.1
425	+4.36	-7.9	473	+3.14	-15.0	521	+4.27	+15.2	569	+4.04	+4.8
426	4.40	7.5	474	3.27	14.7	522	4.28	15.1	570	4.08	7.4
427	4.61	2.4	475	3.27	14.6	523	4.27	15.1	571	4.22	10.9
428	4.60	1.8	476	3.33	13.9	524	4.24	15.3	572	4.22	11.9
429	4.64	1.3	477	3.36	13.6	525	4.21	14.7	573	4.22	12.2
430	+4.62	-0.2	478	+3.48	-13.1	526	+4.21	+13.8	574	+4.25	+12.0
431	4.62	+0.4	479	3.56	12.8	527	4.19	11.7	575	4.22	13.2
432	+4.64	+0.7	480	+3.54	-12.2	528	+4.15	+12.1	576	+4.22	+13.9

REDUCTIONS OF OCCULTATION STARS, 1935 541

REDUCTIONS FROM 1935.0 TO APPARENT PLACE

No.	$\Delta\alpha$	$\Delta\delta$	No.	$\Delta\alpha$	$\Delta\delta$	No.	$\Delta\alpha$	$\Delta\delta$	No.	$\Delta\alpha$	$\Delta\delta$
577	+4.29	+15.4	625	+3.60	-9.8	673	+5.42	+1.2	721	+5.08	+28.8
578	4.25	15.9	626	3.41	10.4	674	5.39	0.7	722	5.35	26.5
579	4.28	17.8	627	3.10	12.1	675	5.38	+0.7	723	5.47	25.2
580	4.31	18.6	628	2.93	12.8	676	5.33	-0.4	724	5.48	25.2
581	4.28	19.3	629	2.75	13.4	677	5.34	2.2	725	5.81	20.7
582	+4.30	+20.4	630	+2.65	-11.2	678	+5.14	-5.2	726	+5.80	+20.6
583	4.30	21.3	631	2.75	10.3	679	5.04	6.8	727	5.82	20.7
584	4.34	21.6	632	3.24	3.1	680	4.84	9.3	728	5.82	20.6
585	4.37	23.8	633	3.24	3.1	681	4.74	10.9	729	5.81	20.4
586	4.37	25.7	634	...	...	682	4.68	11.0	730	5.82	20.3
587	+4.37	+26.1	635	+3.39	-0.6	683	+4.56	-12.8	731	+5.79	+20.2
588	4.40	27.1	636	3.40	-0.1	684	4.49	12.8	732	5.82	+20.1
589	4.47	29.1	637	3.42	+0.1	685	4.30	14.4	733	5.83	-7.8
590	4.47	29.5	638	3.45	1.4	686	3.95	16.6	734	5.68	12.0
591	4.74	28.7	639	3.46	1.6	687	3.86	16.8	735	5.61	12.7
592	+4.93	+22.5	640	+3.49	+2.2	688	+3.74	-17.4	736	+5.59	-13.9
593	4.97	19.6	641	3.54	2.5	689	3.72	17.4	737	5.54	14.2
594	5.00	17.8	642	3.60	5.0	690	3.56	18.4	738	5.47	14.9
595	4.99	17.8	643	3.62	6.8	691	3.54	18.1	739	5.43	16.4
596	5.00	17.7	644	3.64	7.6	692	3.22	18.4	740	5.36	16.5
597	+5.00	+17.7	645	+3.78	+11.2	693	+2.86	-17.3	741	+5.19	-18.6
598	5.01	17.6	646	3.79	12.9	694	2.74	15.8	742	5.16	19.3
599	5.00	17.6	647	3.84	14.8	695	2.72	15.5	743	5.17	19.4
600	4.97	17.6	648	3.92	17.4	696	2.71	14.3	744	4.77	21.9
601	4.95	16.8	649	3.90	18.2	697	3.12	-1.6	745	4.65	22.8
602	+4.94	+16.4	650	+4.00	+20.4	698	+3.26	+3.6	746	+4.63	-22.8
603	4.97	15.9	651	4.08	23.3	699	3.30	4.0	747	4.47	24.0
604	4.99	13.6	652	4.10	25.3	700	3.31	4.6	748	4.17	23.7
605	4.94	13.8	653	4.17	26.4	701	3.32	6.6	749	4.12	24.1
606	4.87	10.2	654	4.26	28.1	702	3.44	10.4	750	3.91	23.2
607	+4.88	+9.9	655	+4.27	+28.4	703	+3.44	+10.6	751	+3.72	-22.2
608	4.78	6.4	656	4.27	28.4	704	3.44	12.0	752	3.54	19.5
609	4.77	5.1	657	4.30	29.0	705	3.53	15.4	753	3.51	19.1
610	4.69	4.4	658	4.34	29.4	706	3.56	16.2	754	3.45	17.4
611	4.64	3.6	659	4.50	30.8	707	3.58	17.9	755	3.43	15.4
612	+4.58	+1.9	660	+4.59	+30.7	708	+3.68	+22.0	756	+3.43	-15.2
613	4.54	+1.6	661	4.88	30.1	709	3.77	23.3	757	3.39	11.9
614	4.46	-0.9	662	5.02	29.0	710	3.98	26.7	758	3.39	11.0
615	4.24	3.2	663	5.52	19.6	711	3.99	27.0	759	3.39	-10.3
616	4.15	5.2	664	5.53	19.5	712	3.99	27.0	760	3.33	+10.4
617	+4.07	-5.1	665	+5.53	+19.3	713	+4.08	+28.2	761	+3.32	+13.2
618	4.07	5.2	666	5.53	19.1	714	4.26	30.0	762	3.34	15.8
619	3.94	6.4	667	5.62	15.0	715	4.29	30.0	763	3.37	16.8
620	3.86	7.2	668	5.56	9.5	716	4.62	30.6	764	3.36	17.5
621	3.83	7.7	669	5.56	6.6	717	4.88	30.1	765	3.37	17.5
622	+3.78	-7.7	670	+5.57	+5.1	718	+4.94	+29.8	766	+3.50	+21.6
623	3.65	9.2	671	5.49	4.1	719	5.02	29.4	767	3.58	23.1
624	+3.60	-9.0	672	+5.46	+3.2	720	+5.06	+29.1	768	3.70	25.2
									769	+3.80	+26.4

ELEMENTS OF OCCULTATIONS, 1935

No.	Star's Name	Mag.	Dec.	T_0	H	Y	x'	y'	Limiting Parallels
JANUARY									
1	153 B. Libræ	6.3	-24 16	^d 1 21 ^h 18.4	-11 28.5	+0.404	0.576	-0.122	+48 -20
2	" Scorpii	3.0	25 56	^m 2 07 36.4	-1 34.5	+0.979	0.585	0.096	+65 +16
3	65 B. Scorpii	5.6	26 09	2 11 14.9	+1 55.4	+0.876	0.588	0.086	+64 +10
4	a Sco. (<i>Antares</i>)	1.2	26 17	2 19 29.1	+9 49.7	+0.399	0.595	-0.062	+42 -20
5	96 B. Aquarii	6.5	10 37	8 00 53.2	+10 09.7	-0.118	0.558	+0.254	+34 -49
6	θ Aquarii	4.3	-8 06	8 11 08.5	-3 56.6	+0.037	0.552	+0.262	+43 -41
7	170 B. Aquarii	6.1	7 31	8 14 08.9	-1 02.5	+0.246	0.550	0.264	+55 -30
8	186 B. Aquarii	6.2	6 53	8 17 38.6	+2 20.0	+0.539	0.548	0.265	+74 -15
9	22 B. Piscium	6.5	-0 04	9 17 42.7	+1 35.8	+0.173	0.538	0.269	+52 -34
10	16 Piscium	5.6	+1 44	9 23 45.0	+7 26.2	-0.029	0.536	0.267	+41 -44
11	36 Piscium	6.2	+7 53	10 18 44.1	+1 48.3	-1.265	0.534	+0.258	-33 -83
12	136 B. Piscium	6.5	9 00	11 06 24.3	-10 54.2	+0.539	0.534	0.248	+76 -13
13	3 Arietis	6.5	17 06	12 13 01.8	-5 16.9	-0.779	0.540	0.210	0 -73
14	4 Arietis	5.7	16 38	12 13 46.2	-4 34.0	-0.150	0.540	0.208	+35 -44
15	1 Arietis	5.2	17 30	12 17 59.8	-0 28.8	-0.190	0.541	0.202	+32 -45
16	35 B. Arietis	6.4	+17 57	12 20 55.2	+2 20.7	-0.069	0.542	+0.197	+39 -38
17	47 B. Arietis	6.5	17 43	12 22 46.8	+4 08.6	+0.526	0.542	0.194	+77 -7
18	15 Arietis	5.9	19 12	13 00 04.6	+5 23.7	-0.770	0.543	0.192	0 -71
19	26 Arietis	6.1	19 34	13 09 10.8	-9 48.6	+0.506	0.546	0.175	+76 -6
20	v Arietis	5.4	21 41	13 12 51.5	-6 15.4	-1.092	0.547	0.168	-23 -69
21	64 Arietis	5.7	+24 30	14 09 05.7	-10 43.2	-1.105	0.554	+0.126	-26 -66
22	7 Tauri	5.9	24 15	14 13 33.4	-6 24.9	-0.303	0.555	0.116	+26 -42
23	16 Tauri	5.4	24 05	14 18 05.8	-2 02.1	+0.372	0.556	0.105	+66 -5
24	17 Tauri	3.8	23 55	14 18 07.8	-2 00.2	+0.563	0.556	0.105	+82 +5
25	18 Tauri	5.6	24 38	14 18 14.8	-1 53.4	-0.202	0.556	0.105	+31 -35
26	q Tauri	4.4	+24 16	14 18 16.2	-1 52.0	+0.199	0.556	+0.105	+55 -14
27	20 Tauri	4.0	24 10	14 18 32.6	-1 36.3	+0.333	0.556	0.104	+04 -7
28	21 Tauri	5.8	24 21	14 18 34.5	-1 34.4	+0.136	0.556	0.104	+51 -17
29	22 Tauri	6.5	24 20	14 18 38.2	-1 30.8	+0.171	0.556	0.104	+53 -16
30	23 Tauri	4.2	23 45	14 18 45.9	-1 23.4	+0.805	0.556	0.104	+90 +18
31	η Tauri	3.0	+23 54	14 19 16.2	-0 54.2	+0.687	0.556	+0.102	+90 +12
32	27 Tauri	3.8	23 52	14 20 00.2	-0 11.7	+0.815	0.556	0.101	+90 +20
33	28 Tauri	5.2	23 57	14 20 00.8	-0 11.2	+0.727	0.556	0.101	+90 +14
34	14 H. Tauri	5.4	25 23	14 20 29.3	+0 16.4	-0.774	0.557	0.100	-2 -65
35	x Tauri	5.4	25 29	15 10 30.9	-10 12.0	+0.289	0.559	+0.066	+61 -6
36	125 Tauri	5.0	+25 52	16 19 58.2	-1 56.3	+0.685	0.558	-0.018	+90 +20
37	139 Tauri	4.9	25 57	17 03 58.5	+5 47.1	+0.371	0.556	0.038	+67 +1
38	e Geminorum	3.2	25 12	18 00 29.6	+1 35.6	-0.076	0.548	0.086	+39 -27
39	δ Cancri	4.2	18 24	20 10 39.1	+9 53.6	-0.820	0.516	0.190	-2 -72
40	R Leonis (<i>var.</i>)	5-10	11 44	21 20 00.5	-5 42.6	-0.369	0.500	0.224	+23 -60
41	43 Leonis	6.3	+6 52	22 15 37.2	-10 38.2	+0.504	0.494	-0.236	+73 -16
42	p ^a Leonis	5.7	2 18	23 16 21.1	-10 34.2	-0.393	0.490	0.244	+22 -65
43	359 B. Leonis	6.3	+0 29	24 01 36.0	-1 34.2	-0.041	0.490	0.245	+9 -85
44	388 B. Leonis	6.3	-1 21	24 04 11.7	+0 57.4	+0.748	0.490	0.245	+89 -4
45	431 B. Leonis	6.2	2 05	24 10 06.4	+6 42.5	+0.111	0.491	0.245	+49 -37
46	q Virginis	5.4	-9 06	25 16 42.6	-11 31.6	+0.450	0.500	-0.235	+67 -19
47	370 B. Virginis	6.0	11 18	26 03 41.2	-0 51.6	+0.310	0.505	0.228	+57 -26
48	85 Virginis	6.2	15 27	27 05 53.4	+0 33.6	-0.880	0.522	0.204	-11 -90
49	43 B. Libræ	5.8	21 08	28 15 25.5	+8 59.6	-0.829	0.552	0.152	-15 -90
50	47 G. Libræ	6.1	21 47	28 19 24.2	-11 10.0	-0.725	0.555	0.144	-10 -90
51	δ Scorpii	4.8	-25 33	29 14 13.9	+6 58.4	+0.895	0.572	-0.102	+65 +10
52	31 B. Scorpii	5.4	24 20	29 15 26.6	+8 08.4	-0.487	0.574	0.099	-2 -75
53	40 B. Scorpii	5.4	24 39	29 17 21.2	+9 58.7	-0.355	0.575	0.094	+5 -65
54	48 B. Scorpii	5.1	25 41	29 19 16.9	+11 49.9	+0.546	0.577	0.089	+54 -12
55	50 B. Scorpii	6.4	-24 33	29 19 31.4	-11 56.2	-0.652	0.577	-0.088	-12 -90

New Moon—Jan. 5^d 05^h
Full Moon—Jan. 19^d 16^h

First Quarter—Jan. 11^d 21^h
Last Quarter—Jan. 27^d 20^h

ELEMENTS OF OCCULTATIONS, 1935

543

No.	Star's Name	Mag.	Dec.	T_0	H	Y	π'	y'	Limiting Parallels
JANUARY									
56	65 B. Scorpii	5.6	-26 09	^{d h m} 29 21 12.3	^{h m} -10 19.1	+0.862	0.578	-0.084	+64° + 8
57	σ Scorpii	3.1	25 26	30 02 26.7	-5 16.9	-0.280	0.583	-0.070	+6 -60
58	α Sco. (Antares)	1.2	26 17	30 05 41.4	-2 09.9	+0.382	0.585	-0.061	+41 -21
59	136 G. Ophiuchi	6.3	25 53	31 03 51.3	-4 53.8	-0.669	0.598	+0.004	-20 -90
60	4 G. Sagittarii	6.2	26 57	31 11 57.0	+2 51.7	+0.544	0.601	0.029	+49 -12
FEBRUARY									
61	λ Sagittarii	2.9	-25 28	1 02 43.6	-6 58.8	-0.178	0.603	+0.076	+12 -54
62	126 B. Sagittarii	5.8	25 05	1 09 01.2	-0 57.0	-0.020	0.603	0.095	+22 -44
63	127 G. Sagittarii	6.4	25 02	1 14 51.2	+4 38.3	+0.541	0.602	0.112	+55 -12
64	22 B. Piscium	6.5	-0 04	6 03 02.8	-11 16.1	+0.164	0.549	0.274	+52 -34
65	16 Piscium	5.6	+1 44	6 08 51.6	-5 39.2	-0.035	0.547	0.273	+41 -45
66	19 Piscium	5.3	+3 08	6 13 23.6	-1 16.5	-0.177	0.546	+0.271	+34 -52
67	η Piscium	3.7	15 01	8 13 11.5	-3 05.6	-0.135	0.547	0.223	+35 -44
68	ι Arietis	5.2	17 30	9 00 48.8	+8 07.7	-0.207	0.549	0.204	+32 -46
69	35 B. Arietis	6.4	17 57	9 03 39.3	+10 52.4	-0.088	0.549	0.199	+38 -39
70	47 B. Arietis	6.5	17 43	9 05 28.0	-11 22.6	+0.499	0.550	0.196	+75 -8
71	16 Tauri	5.4	+24 05	10 23 59.1	+5 38.6	+0.343	0.558	+0.106	+64 -7
72	17 Tauri	3.8	23 55	11 00 01.1	+5 40.6	+0.534	0.558	0.106	+80 +3
73	18 Tauri	5.6	24 38	11 00 08.0	+5 47.3	-0.226	0.558	0.105	+30 -36
74	η Tauri	4.4	24 16	11 00 09.5	+5 48.7	+0.172	0.558	0.105	+53 -16
75	20 Tauri	4.0	24 10	11 00 25.6	+6 04.2	+0.305	0.558	0.104	+62 -9
76	21 Tauri	5.8	+24 21	11 00 27.6	+6 06.1	+0.110	0.558	+0.104	+49 -19
77	22 Tauri	6.5	24 20	11 00 31.2	+6 09.7	+0.144	0.558	0.104	+51 -17
78	23 Tauri	4.2	23 45	11 00 38.0	+6 17.0	+0.773	0.558	0.104	+90 +17
79	η Tauri	3.0	23 54	11 01 08.8	+6 45.9	+0.657	0.558	0.103	+90 +10
80	27 Tauri	3.8	23 52	11 01 52.4	+7 27.9	+0.784	0.558	0.101	+90 +17
81	28 Tauri	5.2	+23 57	11 01 52.9	+7 28.4	+0.696	0.558	+0.101	+90 +12
82	14 H. Tauri	5.4	25 23	11 02 21.2	+7 55.7	-0.794	0.558	0.100	-3 -65
83	ρ Tauri	5.6	26 19	11 11 12.0	-7 32.5	-0.998	0.559	0.078	-18 -64
84	χ Tauri	5.4	25 29	11 16 16.5	-2 39.0	+0.261	0.559	+0.066	+59 -7
85	112 B. Aurigæ	5.7	26 53	13 00 33.5	+4 28.8	-0.435	0.556	-0.015	+18 -41
86	125 Tauri	5.0	+25 52	13 01 42.4	+5 35.4	+0.660	0.556	-0.018	+90 +18
87	52 B. Geminorum	6.4	24 39	14 03 26.0	+6 25.4	+0.750	0.547	0.078	+90 +18
88	37 Geminorum	5.8	25 28	14 11 35.4	-9 41.7	-0.854	0.543	0.096	-7 -65
89	ω Geminorum	5.2	24 19	14 14 53.2	-6 30.5	+0.082	0.541	0.103	+48 -20
90	58 Geminorum	6.0	23 04	15 00 45.6	+3 02.4	+0.331	0.536	0.123	+63 -10
91	B.D.+23° 1744	6.4	+23 02	15 05 12.8	+7 21.0	-0.187	0.534	-0.132	+32 -38
92	187 B. Geminorum	6.2	23 10	15 09 06.5	+11 07.1	-0.871	0.532	0.139	-7 -67
93	θ Cancrī	5.6	18 19	16 10 10.3	+11 24.2	+0.502	0.519	0.180	+75 -8
94	α ¹ Cancrī	5.2	15 34	16 23 22.9	+0 13.3	+1.059	0.512	0.197	+90 +23
95	ρ ⁵ Leonis	5.4	+0 17	20 02 17.6	+1 03.5	+0.966	0.492	0.245	+90 +10
96	431 B. Leonis	6.2	-2 05	20 16 08.0	-9 28.4	+0.184	0.493	-0.245	+53 -33
97	78 B. Virginis	6.5	5 22	21 12 03.2	+9 54.2	-1.034	0.497	0.240	-15 -90
98	η Virginis	5.4	9 06	21 22 42.0	+3 44.8	+0.545	0.501	0.235	+73 -14
99	370 B. Virginis	6.0	11 18	22 09 42.4	+6 56.9	+0.411	0.506	0.228	+63 -21
100	69 Virginis	4.9	15 38	23 02 57.4	-0 18.3	+1.339	0.515	0.212	+73 +47
101	75 Virginis	5.6	-15 02	23 05 42.7	+2 22.1	+0.095	0.516	-0.210	+42 -37
102	85 Virginis	6.2	15 27	23 12 06.9	+8 34.6	-0.775	0.520	0.202	-5 -90
103	231 G. Virginis	6.4	18 17	24 03 29.4	-0 31.7	-0.655	0.531	0.182	-1 -90
104	236 G. Virginis	5.7	18 25	24 04 14.7	+0 12.1	-0.649	0.532	0.180	-1 -89
105	17 G. Libræ	6.4	20 54	24 17 08.2	-11 19.7	-0.170	0.542	0.159	+21 -53
106	18 G. Libræ	6.1	-21 03	24 17 36.9	-10 52.0	-0.083	0.542	-0.158	+26 -47
107	43 B. Libræ	5.8	21 08	24 22 15.0	-6 23.2	-0.721	0.546	0.150	-9 -90
108	47 G. Libræ	6.1	21 47	25 02 19.6	-2 27.0	-0.615	0.549	0.142	-4 -87
109	42 Libræ	5.1	23 37	25 17 08.6	+11 50.6	-0.548	0.560	0.111	-3 -81
110	4 Scorpii	4.7	-25 08	25 22 48.4	-6 41.8	+0.472	0.565	-0.098	+50 -16

New Moon—Feb. 3^d 16^h
Full Moon—Feb. 18^d 11^h

First Quarter—Feb. 10^d 09^h
Last Quarter—Feb. 26^d 10^h

No.	Star's Name	Mag.	Dec.	T_0	H	Y	x'	y'	Limiting Parallels
FEBRUARY									
111	31 B. Scorpii	5.4	-24 21	25 22 56.2	- 6 34.4	-0.376	0.565	-0.097	+ 4 -67
112	3 Scorpii	5.9	25 03	25 23 15.0	- 6 16.3	+0.343	0.565	0.096	+42 -23
113	40 B. Scorpii	5.4	24 39	26 00 54.4	- 4 40.5	-0.243	0.566	0.092	+11 -58
114	48 B. Scorpii	5.1	25 41	26 02 53.8	- 2 45.5	+0.671	0.568	0.088	+62 -4
115	50 B. Scorpii	6.4	24 33	26 03 08.8	- 2 31.1	-0.544	0.568	0.087	-6 -81
116	65 B. Scorpii	5.6	-26 09	26 04 53.0	- 0 50.8	+0.992	0.569	-0.083	+64 +17
117	85 B. Scorpii	6.2	25 19	26 07 42.2	+ 1 52.1	-0.113	0.571	0.076	+15 -49
118	σ Scorpii	3.1	25 26	26 10 17.9	+ 4 22.0	-0.169	0.573	0.069	+12 -53
119	α Sco. (<i>Antares</i>)	1.2	26 18	26 13 39.3	+ 7 35.8	+0.502	0.575	0.060	+49 -14
120	22 Scorpii	4.9	24 58	26 13 59.8	+ 7 55.5	-0.891	0.575	0.059	-28 -90
121	36 Oph. (<i>1st star</i>)	5.3	-26 31	27 08 04.8	+ 1 18.4	+0.080	0.585	-0.009	+20 -38
122	4 G. Sagittarii	6.2	26 57	27 21 01.6	-10 15.8	+0.656	0.589	+0.028	+58 -5
123	67 B. Sagittarii	6.4	25 38	28 08 45.6	+ 0 59.9	-0.158	0.592	0.063	+12 -52
124	68 G. Sagittarii	6.2	26 41	28 12 14.5	+ 4 20.3	+1.138	0.592	0.073	+64 +31
125	86 B. Sagittarii	6.5	26 38	28 12 42.8	+ 4 47.5	+1.122	0.592	0.075	+64 +29
126	126 B. Sagittarii	5.8	-25 05	28 18 52.2	+10 41.9	+0.069	0.592	+0.092	+26 -39
MARCH									
127	162 B. Sagittarii	6.6	-24 58	1 00 06.1	- 8 16.8	+0.478	0.591	+0.108	+51 -16
128	127 G. Sagittarii	6.4	25 02	1 00 54.2	- 7 30.6	+0.634	0.591	0.110	+61 -7
129	189 B. Sagittarii	6.2	-24 46	1 03 56.8	- 4 35.4	+0.705	0.591	0.118	+65 -3
130	75 Piscium	6.2	+12 37	7 11 47.4	- 2 18.6	-0.411	0.556	0.242	+21 -62
131	η Piscium	3.7	15 01	7 22 41.8	+ 8 12.7	-0.266	0.557	0.227	+28 -51
132	35 B. Arietis	6.4	+17 57	8 12 40.0	- 2 19.0	-0.232	0.560	+0.202	+30 -47
133	15 Arietis	5.9	19 12	8 15 38.2	+ 0 32.8	-0.916	0.561	0.197	-9 -71
134	26 Arietis	6.1	19 34	9 00 13.2	+ 8 49.2	+0.317	0.562	0.180	+62 -16
135	11 Tauri	6.2	25 07	10 05 52.8	-10 36.2	-1.098	0.566	0.111	-26 -65
136	17 Tauri	3.8	23 55	10 07 37.1	- 8 55.7	+0.358	0.567	0.107	+65 -6
137	η Tauri	4.4	+24 16	10 07 45.3	- 8 47.8	+0.001	0.567	+0.106	+43 -24
138	20 Tauri	4.0	24 10	10 08 01.0	- 8 32.7	+0.132	0.567	0.106	+50 -17
139	21 Tauri	5.8	24 21	10 08 02.9	- 8 30.9	-0.060	0.567	0.106	+39 -28
140	22 Tauri	6.5	24 20	10 08 06.4	- 8 27.5	-0.026	0.567	0.106	+41 -26
141	14 H. Tauri	5.4	25 23	10 09 53.4	- 6 44.4	-0.952	0.567	0.101	-14 -65
142	χ Tauri	5.4	+25 29	10 23 27.6	+ 6 19.8	+0.087	0.566	+0.067	+48 -16
143	125 Tauri	5.0	25 52	12 08 17.0	-10 02.5	+0.484	0.559	-0.017	+76 +9
144	139 Tauri	4.9	25 57	12 16 13.5	- 2 23.0	+0.178	0.556	0.037	+54 -9
145	ϵ Geminorum	3.2	25 12	13 12 41.6	- 6 37.4	-0.253	0.546	0.084	+28 -36
146	37 Geminorum	5.8	25 28	13 17 53.1	- 1 36.5	-0.007	0.543	0.095	-18 -65
147	48 Geminorum	5.8	+24 14	14 01 49.7	+ 6 04.2	-0.494	0.539	-0.112	+15 -53
148	B.D. +23° 1744	6.4	23 02	14 11 28.1	- 8 36.3	-0.331	0.533	0.130	+24 -45
149	217 B. Geminorum	6.3	20 00	15 01 02.1	+ 4 31.9	+1.083	0.526	0.154	+90 +31
150	δ Cancri	4.2	18 24	15 23 08.6	+ 1 58.1	-0.924	0.514	0.187	-9 -72
151	α Cancri	5.2	15 34	16 05 41.1	+ 8 19.0	+0.958	0.511	0.195	+90 +16
152	α Cancri	5.6	+15 50	16 05 51.5	+ 8 29.0	+0.636	0.511	-0.195	+87 -2
153	81 Cancri	6.4	15 15	16 13 37.0	- 7 58.9	-0.276	0.507	0.204	+28 -52
154	π Cancri	5.6	15 13	16 15 09.4	- 6 29.2	-0.540	0.507	0.206	+14 -68
155	43 Leonis	6.3	+ 6 52	18 04 07.6	+ 5 27.1	+0.516	0.496	0.235	+74 -15
156	83 Virginis	5.7	-15 52	22 17 08.6	- 8 35.3	-0.053	0.523	0.203	+33 -46
157	9 G. Libræ	6.5	-20 10	23 17 22.7	- 9 07.5	+0.083	0.540	-0.168	+36 -38
158	43 B. Libræ	5.8	21 08	24 03 45.1	+ 0 54.1	-0.520	0.547	0.149	+2 -77
159	47 G. Libræ	6.1	21 47	24 07 50.4	+ 4 51.1	-0.412	0.550	0.141	+7 -69
160	64 G. Libræ	5.7	22 10	24 12 16.7	+ 9 08.2	-0.612	0.553	0.132	+5 -86
161	153 B. Libræ	6.3	24 16	24 19 38.4	- 7 45.6	+0.720	0.558	0.117	+66 -2
162	42 Libræ	5.1	-23 37	24 22 44.8	- 4 45.8	-0.335	0.560	-0.110	+7 -63
163	β Scorpii	4.8	25 34	25 03 20.0	- 0 20.4	+1.251	0.562	0.099	+65 +46
164	31 B. Scorpii	5.4	24 21	25 04 35.8	+ 0 52.6	-0.160	0.563	0.096	+15 -52
165	32 B. Scorpii	5.4	-23 47	25 04 37.0	+ 0 53.8	-0.750	0.563	-0.096	-16 -90

Full Moon—Feb. 18^d 11^hNew Moon—Mar. 5^d 03^hLast Quarter—Feb. 26^d 10^hFirst Quarter—Mar. 12^d 01^hFull Moon—Mar. 20^d 06^h

ELEMENTS OF OCCULTATIONS, 1935

545

No.	Star's Name	Mag.	Dec.	T_0	H	Y	x'	y'	Limiting Parallels	
MARCH										
166	40 B. Scorpii	5.4	-24 39	25 06 35.4	+ 2 47.9	-0.023	0.564	-0.092	+22	-44
167	48 B. Scorpii	5.1	25 41	25 08 36.2	+ 4 44.3	+0.897	0.566	0.087	+65	+10
168	50 B. Scorpii	6.4	24 33	25 08 51.3	+ 4 58.8	-0.327	0.566	0.086	+ 6	-63
169	σ Scorpii	3.1	25 26	25 16 06.4	+11 57.9	+0.053	0.570	0.068	+24	-39
170	α Sco. (<i>Antares</i>)	1.2	26 18	25 19 31.0	- 8 45.1	+0.732	0.572	0.059	+64	0
171	116 B. Scorpii	6.2	-26 24	25 20 20.1	- 7 57.9	+0.798	0.572	-0.057	+64	+ 4
172	136 G. Ophiuchi	6.3	25 53	26 18 58.1	-10 11.7	-0.352	0.580	+0.004	- 3	-65
173	4 G. Sagittarii	6.2	26 57	27 03 35.4	- 1 54.4	+0.892	0.582	0.028	+64	+11
174	70 B. Sagittarii	6.4	24 57	27 16 48.7	+10 47.8	-0.569	0.583	0.065	- 9	-83
175	λ Sagittarii	2.9	25 28	27 19 22.7	-10 44.1	+0.136	0.583	0.072	+28	-35
176	162 B. Sagittarii	6.6	-24 58	28 07 31.7	+ 0 56.4	+0.703	0.581	+0.105	+65	- 3
177	127 G. Sagittarii	6.4	25 02	28 08 21.4	+ 1 44.3	+0.861	0.581	0.107	+65	+ 8
178	172 B. Sagittarii	5.7	24 56	28 09 11.0	+ 2 32.0	+0.852	0.581	0.109	+66	+ 7
179	189 B. Sagittarii	6.2	24 46	28 11 30.5	+ 4 46.0	+0.931	0.581	0.116	+66	+12
180	σ Capricorni	5.5	19 19	29 16 36.7	+ 8 45.7	-0.180	0.572	0.184	+23	-53
181	π Capricorni	5.2	-18 26	29 19 55.3	+11 56.8	-0.460	0.570	+0.191	+ 9	-71
182	12 Capricorni	6.1	18 48	29 20 59.7	-11 01.2	+0.122	0.570	0.194	+39	-36
183	81 B. Capricorni	6.4	18 17	30 05 10.5	- 3 08.5	+1.242	0.567	0.209	+72	+36
184	94 B. Capricorni	6.0	16 17	30 08 43.4	+ 0 16.6	-0.001	0.566	0.215	+35	-42
185	96 B. Aquarii	6.5	-10 37	31 08 53.9	- 0 25.0	+0.006	0.558	0.250	+40	-42
APRIL										
186	16 Tauri	5.4	+24 05	6 16 58.1	+ 2 13.4	-0.048	0.576	+0.107	+40	-27
187	17 Tauri	3.8	23 55	6 17 00.0	+ 2 15.2	+0.138	0.576	0.107	+51	-17
188	18 Tauri	5.6	24 38	6 17 06.6	+ 2 21.5	-0.602	0.576	0.107	+ 9	-59
189	23 Tauri	4.2	23 45	6 17 35.7	+ 2 49.6	+0.370	0.576	0.106	+66	- 5
190	η Tauri	3.0	23 54	6 18 04.1	+ 3 16.9	+0.256	0.576	0.104	+58	-11
191	27 Tauri	3.8	+23 52	6 18 45.4	+ 3 56.6	+0.379	0.576	+0.103	+66	- 4
192	28 Tauri	5.2	23 56	6 18 45.9	+ 3 57.1	+0.203	0.576	0.103	+60	- 9
193	κ Tauri	5.6	24 57	7 23 04.9	+ 7 11.9	+1.099	0.572	+0.027	+90	+46
194	125 Tauri	5.0	25 52	8 16 27.3	- 0 04.4	+0.219	0.566	-0.018	+56	- 5
195	139 Tauri	4.9	25 57	9 00 13.6	+ 7 24.9	-0.089	0.562	0.038	+37	-23
196	52 B. Geminorum	6.4	+24 39	9 17 26.7	+ 0 01.3	+0.309	0.532	-0.078	+62	- 6
197	87 B. Geminorum	5.8	23 41	9 23 57.9	+ 6 19.0	+0.799	0.548	0.093	+90	+19
198	48 Geminorum	5.8	24 14	10 09 16.1	- 8 41.7	-0.703	0.542	0.112	- 1	-66
199	58 Geminorum	6.0	23 04	10 14 23.8	- 3 44.2	-0.092	0.539	0.122	+37	-31
200	B.D.+23° 1744	6.4	23 02	10 18 47.8	+ 0 31.1	-0.600	0.536	0.130	+ 9	-62
201	192 B. Geminorum	6.3	+22 33	10 23 48.0	+ 5 21.6	-0.759	0.533	-0.140	0	-68
202	85 Geminorum	5.4	20 03	11 05 44.8	+11 07.0	+1.120	0.529	0.150	+90	+35
203	δ^1 Cancri	5.9	18 32	11 19 25.1	+ 0 21.7	+0.594	0.520	0.171	+83	- 2
204	α^1 Cancri	5.2	15 34	12 12 45.4	- 6 49.2	+0.706	0.511	0.194	+90	+ 1
205	α^2 Cancri	5.6	15 50	12 12 55.7	- 6 39.1	+0.386	0.511	0.194	+66	-16
206	81 Cancri	6.4	+15 15	12 20 40.4	+ 0 52.1	-0.515	0.507	-0.202	+15	-66
207	83 B. Leonis	5.9	9 14	13 20 29.4	+ 0 00.8	+1.062	0.498	0.224	+90	+19
208	43 Leonis	6.3	6 52	14 11 10.3	- 9 42.6	+0.334	0.495	0.233	+62	-24
209	35 Sextantis	6.0	5 05	14 22 30.7	+ 1 19.3	-0.359	0.494	0.238	+24	-62
210	β^4 Leonis	5.7	2 18	15 11 42.1	+ 9 50.8	-0.445	0.494	0.241	+19	-69
211	β^5 Leonis	5.4	+ 0 17	15 15 31.3	- 6 07.7	+0.868	0.494	-0.242	+90	+ 4
212	359 B. Leonis	6.3	+ 0 29	15 20 50.3	- 0 57.4	-0.646	0.495	0.242	+ 9	-85
213	388 B. Leonis	6.3	- 1 21	15 23 24.0	+ 1 32.1	+0.751	0.496	0.242	+89	- 3
214	431 B. Leonis	6.2	2 05	16 05 13.8	+ 7 12.4	+0.146	0.497	0.242	+50	-35
215	η Virginis	5.4	9 06	17 11 21.4	-11 30.5	+0.636	0.507	0.233	+79	- 8
216	153 B. Libræ	6.3	-24 16	21 01 21.9	- 0 14.7	+0.894	0.563	-0.116	+66	+10
217	169 B. Libræ	5.8	22 56	21 03 22.8	+ 1 41.9	-0.757	0.564	0.111	-15	-90
218	42 Libræ	5.1	23 37	21 04 26.2	+ 2 43.0	-0.152	0.565	0.109	+17	-51
219	α Scorpii	4.7	25 08	21 10 05.6	+ 8 10.0	+0.882	0.568	0.096	+65	+10
220	32 B. Scorpii	5.4	-23 47	21 10 14.6	+ 8 18.7	-0.556	0.568	-0.095	- 6	-81

Last Quarter—Mar. 27^d 21^hNew Moon—Apr. 3^d 12^hFirst Quarter—Apr. 10^d 18^hFull Moon—Apr. 18^d 21^hLast Quarter—Apr. 26^d 04^h

No.	Star's Name	Mag.	Dec.	T_0	H	Y	x'	y'	Limiting Parallels
APRIL									
221	3 Scorpii	5.9	-25° 03'	21 10 32.2	+ 8 35.6	+0.754	0.568	-0.094	+65° + 1
222	50 B. Scorpii	6.4	24 33	21 14 26.3	-11 38.8	-0.129	0.570	0.085	+16° -50
223	24 G. Scorpii	6.2	24 18	21 16 05.8	-10 03.0	-0.539	0.571	0.081	- 6° -80
224	85 B. Scorpii	6.2	25 19	21 19 00.8	- 7 14.5	+0.313	0.573	0.074	+38° -25
225	c Scorpii	3.1	25 26	21 21 37.5	- 4 43.7	+0.261	0.574	0.067	+35° -27
226	a Sco. (<i>Antares</i>)	1.2	-26 18	22 01 00.5	- 1 28.3	+0.942	0.576	-0.058	+64° +14
227	22 Scorpii	4.9	24 59	22 01 21.2	- 1 08.4	-0.460	0.576	0.057	- 4° -73
228	116 B. Scorpii	6.2	26 24	22 01 49.2	- 0 41.4	+1.010	0.576	0.056	+64° +20
229	118 B. Ophiuchi	6.2	26 26	22 16 16.9	-10 46.9	+0.502	0.581	0.017	+46° -14
230	36 Oph. (<i>1st star</i>)	5.3	26 31	22 19 42.6	- 7 29.1	+0.544	0.582	-0.008	+48° -11
231	136 G. Ophiuchi	6.3	-25 53	23 00 21.6	- 3 00.8	-0.112	0.582	+0.005	+ 9° -49
232	151 G. Ophiuchi	6.0	26 13	23 02 17.5	- 1 09.5	+0.251	0.582	0.010	+29° -28
233	4 G. Sagittarii	6.2	26 57	23 08 59.3	+ 5 16.8	+1.142	0.583	0.029	+64° +33
234	67 B. Sagittarii	6.4	25 38	23 21 07.3	- 7 03.5	+0.323	0.582	0.062	+38° -24
235	70 B. Sagittarii	6.4	24 57	23 22 16.0	- 5 57.4	-0.312	0.582	0.066	+ 4° -62
236	126 B. Sagittarii	5.8	-25 05	24 07 39.0	+ 3 03.8	+0.558	0.580	+0.091	+55° -11
237	191 B. Sagittarii	6.5	23 18	24 17 22.7	-11 34.9	-0.273	0.578	0.116	+11° -59
238	π Capricorni	5.2	18 26	26 02 12.4	- 3 58.6	-0.194	0.564	0.189	+23° -54
239	18 Aquarii	5.5	13 09	27 03 03.2	- 4 00.8	-0.318	0.553	0.229	+21° -61
240	ρ Aquarii	5.4	- 8 09	28 04 21.1	- 3 34.8	+0.779	0.546	0.255	+82° - 1
241	19 Piscium	5.3	+ 3 08	29 20 00.4	+10 44.7	-0.123	0.545	+0.264	+36° -49
MAY									
242	118 Tauri	5.4	+25 06	5 21 18.9	+ 6 44.9	+0.860	0.574	-0.008	+90° +31
243	Venus	-3.5	25 16	5 23 05.0	+ 8 27.0	+0.668	0.524	0.017	+90° +19
244	139 Tauri	4.9	25 57	6 09 17.4	+ 5 43.4	-0.324	0.569	0.039	+24° -36
245	e Geminorum	3.2	25 12	7 05 03.3	-10 40.2	-0.780	0.557	0.087	- 3° -65
246	δ Geminorum	3.5	22 06	7 21 19.8	+ 5 02.7	+0.864	0.545	0.121	+90° +20
247	58 Geminorum	6.0	+23 04	7 22 51.2	+ 6 31.0	-0.372	0.544	-0.124	+22° -47
248	149 B. Geminorum	6.4	21 40	8 00 26.1	+ 8 02.7	+0.954	0.543	0.127	+90° +25
249	63 Geminorum	5.3	21 35	8 00 50.6	+ 8 26.4	+0.996	0.542	0.128	+90° +28
250	192 B. Geminorum	6.3	22 33	8 08 07.6	- 8 31.0	-1.042	0.537	0.141	-20° -68
251	85 Geminorum	5.4	20 03	8 14 00.0	- 2 50.1	+0.821	0.533	0.151	+90° +14
252	217 B. Geminorum	6.3	+20 00	8 16 27.9	- 0 26.8	+0.510	0.531	-0.155	+76° - 4
253	δ ¹ Cancri	5.9	18 32	9 03 31.2	+10 15.6	+0.292	0.523	0.172	+59° -17
254	54 Cancri	6.3	15 36	9 17 30.9	- 0 10.1	+0.993	0.514	0.190	+90° +20
255	R Leonis (<i>var.</i>)	5-10	11 44	10 23 28.0	+ 4 55.2	-0.910	0.500	0.219	- 7° -79
256	83 B. Leonis	5.9	9 14	11 04 19.7	+ 9 38.8	+0.768	0.498	0.223	+90° + 1
257	89 B. Leonis	6.3	+ 8 37	11 05 15.4	+10 33.0	+1.243	0.498	-0.223	+90° +35
258	π Leonis	4.9	8 21	11 06 24.2	+11 39.9	+1.284	0.498	0.224	+90° +39
259	43 Leonis	6.3	6 52	11 19 00.2	- 0 04.9	+0.055	0.494	0.231	+45° -38
260	155 B. Leonis	6.5	6 01	11 19 08.9	+ 0 03.6	+0.960	0.494	0.231	+90° +11
261	35 Sextantis	6.0	5 05	12 06 21.4	+10 57.8	-0.624	0.493	0.236	+10° -82
262	ρ ⁴ Leonis	5.7	+ 2 18	12 19 34.2	- 0 10.8	-0.691	0.493	-0.239	+ 6° -88
263	431 B. Leonis	6.2	- 2 05	13 13 08.2	- 7 05.5	-0.069	0.495	0.240	+38° -46
264	78 B. Virginis	6.5	5 22	14 08 48.9	-11 57.4	-1.154	0.502	0.236	-25° -90
265	γ Virginis	5.4	9 06	14 19 17.2	- 1 46.9	+0.484	0.506	0.231	+69° -17
266	σ Scorpii	3.1	25 26	19 04 29.8	+ 3 56.2	+0.353	0.580	0.066	+40° -22
267	a Sco. (<i>Antares</i>)	1.2	-26 18	19 07 49.2	+ 7 07.9	+1.035	0.582	-0.057	+64° +22
268	36 Oph. (<i>1st star</i>)	5.3	26 31	20 02 10.7	+ 0 46.5	+0.675	0.588	-0.006	+59° - 3
269	70 B. Sagittarii	6.4	24 57	21 04 16.4	+ 1 50.4	-0.131	0.588	+0.068	+14° -50
270	λ Sagittarii	2.9	25 28	21 06 49.2	+ 4 17.1	+0.578	0.588	0.075	+55° - 9
271	26 Sagittarii	6.1	23 54	21 12 20.8	+ 9 35.7	-0.571	0.586	0.090	- 7° -83
272	154 B. Sagittarii	5.9	-23 16	21 18 00.1	- 8 58.2	-0.672	0.584	+0.105	-11° -90
273	191 B. Sagittarii	6.5	23 18	21 23 06.8	- 4 03.4	-0.065	0.582	0.118	+22° -46
274	222 B. Sagittarii	5.6	22 32	22 03 55.9	+ 0 34.5	-0.254	0.580	0.130	+13° -57
275	π Capricorni	5.2	-18 25	23 07 41.4	+ 3 17.7	+0.046	0.565	+0.190	+35° -39

Full Moon—Apr. 18^d 21^hNew Moon—May 2^d 22^hFull Moon—May 18^d 10^hLast Quarter—Apr. 26^d 04^hFirst Quarter—May 10^d 12^h

ELEMENTS OF OCCULTATIONS, 1935

547

No.	Star's Name	Mag.	Dec.	T_0	H	Y	z'	y'	Limiting Parallels
MAY									
276	ρ Capricorni	5.0	-18 02	23 08 21.1	+ 3 56.0	-0.230	0.565	+0.191	+21 -55
277	12 Capricorni	6.1	18 48	23 08 47.2	+ 4 21.2	+0.635	0.565	0.192	+69 -8
278	94 B. Capricorni	6.0	16 17	23 20 49.6	- 8 02.3	+0.512	0.558	0.212	+65 -15
279	18 Aquarii	5.5	13 09	24 08 34.8	+ 3 18.2	-0.067	0.552	0.228	+34 -46
280	λ Capricorni	5.4	11 40	24 18 39.9	-10 57.5	+0.782	0.547	0.239	+79 0
281	96 B. Aquarii	6.5	-10 37	24 21 53.4	- 7 50.5	+0.498	0.546	+0.243	+68 -16
282	θ Aquarii	4.3	8 06	25 08 34.8	+ 2 29.4	+0.598	0.542	0.251	+77 -11
283	ρ Aquarii	5.4	8 09	25 10 08.5	+ 4 00.0	+1.032	0.542	0.252	+82 +15
284	170 B. Aquarii	6.1	7 31	25 11 41.7	+ 5 30.0	+0.792	0.542	0.253	+83 0
285	κ Aquarii	5.3	- 4 34	25 18 19.8	+11 54.9	-0.511	0.540	0.256	+15 -73
286	κ Piscium	4.9	+ 0 54	26 17 25.4	+10 15.2	-0.043	0.538	+0.261	+40 -44
287	16 Piscium	5.6	1 45	26 21 52.7	- 9 26.2	+0.265	0.538	0.260	+57 -28
288	λ Piscium	4.6	1 26	27 00 32.3	- 6 51.8	+1.280	0.538	0.260	+90 +36
289	19 Piscium	5.3	3 08	27 02 34.6	- 4 53.6	+0.083	0.538	0.259	+47 -37
290	d Piscium	5.6	7 50	27 18 33.5	+10 33.8	-0.600	0.542	0.252	+11 -77
291	4 Arietis	5.7	+16 38	29 10 11.6	+ 0 51.0	-0.361	0.557	+0.207	+23 -55
JUNE									
292	58 Geminorum	6.0	+23 04	4 07 31.6	- 7 00.7	-0.545	0.548	-0.126	+12 -58
293	63 Geminorum	5.3	21 35	4 09 30.0	- 5 06.3	+0.816	0.546	0.130	+90 +16
294	79 Geminorum	6.3	20 28	4 17 35.1	+ 2 42.6	+0.909	0.540	0.145	+90 +20
295	10 H. Cancr	6.1	19 02	5 02 54.1	+11 43.5	+1.064	0.533	0.160	+90 +29
296	d^1 Cancr	5.9	18 32	5 11 57.4	- 3 30.4	+0.081	0.527	0.174	+46 -28
297	θ Cancr	5.6	+18 19	5 16 01.9	+ 0 26.6	-0.392	0.524	-0.180	+21 -55
298	54 Cancr	6.3	15 36	6 01 50.8	+ 9 57.5	+0.768	0.517	0.192	+90 + 6
299	α Leonis	3.8	10 11	7 04 11.8	+11 32.6	+1.305	0.503	0.217	+87 +43
300	155 B. Leonis	6.5	+ 6 01	8 03 17.6	+10 00.0	+0.716	0.494	0.231	+90 - 3
301	431 B. Leonis	6.2	- 2 05	9 21 25.4	+ 2 59.5	-0.295	0.493	0.238	+27 -59
302	13 B. Virginis	5.8	- 4 59	10 04 27.4	+ 9 50.0	+1.222	0.495	-0.237	+86 +30
303	370 B. Virginis	6.0	11 18	11 14 40.2	- 4 54.7	+0.244	0.509	0.222	+52 -29
304	75 Virginis	5.6	15 02	12 10 21.2	- 9 48.9	+0.086	0.523	0.204	+41 -37
305	83 Virginis	5.7	15 52	12 16 05.7	- 4 15.2	-0.180	0.527	0.198	+26 -52
306	231 G. Virginis	6.4	18 17	13 07 40.2	+10 49.4	-0.495	0.540	0.177	+ 7 -74
307	236 G. Virginis	5.7	-18 25	13 08 24.4	+11 32.1	-0.484	0.540	-0.176	+ 8 -73
308	9 G. Libræ	6.5	20 10	13 15 51.8	- 5 15.3	+0.105	0.547	0.164	+36 -36
309	17 G. Libræ	6.4	20 54	13 20 59.1	- 0 18.5	+0.082	0.551	0.155	+34 -37
310	18 G. Libræ	6.1	21 04	13 21 27.0	+ 0 08.5	+0.171	0.552	0.154	+39 -33
311	43 B. Libræ	5.8	21 08	14 01 58.2	+ 4 30.2	-0.430	0.556	0.145	+ 7 -70
312	47 G. Libræ	6.1	-21 47	14 05 56.6	+ 8 20.2	-0.298	0.559	-0.138	+12 -60
313	64 G. Libræ	5.7	22 10	14 10 15.0	-11 30.6	-0.471	0.563	0.129	+ 3 -73
314	153 B. Libræ	6.3	24 16	14 17 22.8	- 4 38.2	+0.883	0.569	0.113	+66 + 9
315	42 Libræ	5.1	23 37	14 20 23.1	- 1 44.6	-0.140	0.571	0.106	+17 -51
316	A Scorpii	4.7	25 08	15 01 54.8	+ 3 34.7	+0.904	0.575	0.093	+65 +11
317	31 B. Scorpii	5.4	-24 21	15 02 02.3	+ 3 42.0	+0.064	0.575	-0.093	+26 -38
318	32 B. Scorpii	5.4	23 47	15 02 03.5	+ 3 43.1	-0.518	0.575	0.092	- 4 -77
319	40 B. Scorpii	5.4	24 39	15 03 57.8	+ 5 33.1	+0.207	0.577	0.088	+34 -30
320	48 B. Scorpii	5.1	25 41	15 05 54.4	+ 7 25.3	+1.125	0.578	0.083	+65 +30
321	σ Scorpii	3.1	25 26	15 13 08.6	- 9 37.1	+0.332	0.583	0.064	+39 -23
322	α Sco. (<i>Antares</i>)	1.2	-26 18	15 16 25.8	- 6 27.5	+1.016	0.585	-0.055	+64 +20
323	22 Sco. Scorpii	4.9	24 59	15 16 45.9	- 6 08.2	-0.366	0.585	-0.054	0 -66
324	λ Sagittarii	2.9	25 28	17 14 38.4	-10 05.9	+0.632	0.595	+0.077	+59 - 6
325	π Capricorni	5.2	18 25	19 14 22.2	+11 46.1	+0.171	0.573	0.193	+42 -33
326	ρ Capricorni	5.0	18 02	19 15 01.0	-11 36.5	-0.102	0.572	0.194	+28 -48
327	12 Capricorni	6.1	-18 48	19 15 26.6	-11 12.0	+0.754	0.572	+0.195	+72 - 1
328	47 B. Capricorni	6.2	16 45	19 17 49.2	- 8 54.6	-0.835	0.571	0.200	-11 -90
329	61 B. Capricorni	5.9	16 21	19 19 56.1	- 6 52.4	-0.804	0.570	0.203	- 9 -90
330	95 B. Capricorni	6.0	-14 44	20 03 40.0	+ 0 34.5	-0.810	0.565	+0.216	- 7 -90

Last Quarter—May 25^d 10^hNew Moon—June 1^d 08^hFirst Quarter—June 9^d 06^hFull Moon—June 16^d 20^hLast Quarter—June 23^d 14^h

ELEMENTS OF OCCULTATIONS, 1935

No.	Star's Name	Mag.	Dec.	T_0	H	Y	x'	y'	Limiting Parallels
JUNE									
331	18 Aquarii	5.5	-13° 09'	20 14 43.4	+11 14.2	+0.083	0.558	+0.231	+42 -38
332	72 B. Aquarii	6.5	11 51	20 16 30.4	-11 02.5	-0.816	0.557	0.234	-5 -90
333	137 B. Capricorni	6.2	10 52	20 21 28.9	-6 14.5	-0.624	0.554	0.239	+6 -84
334	c ^a Capricorni	6.2	9 34	21 00 31.1	-3 18.6	-1.192	0.553	0.242	-30 -90
335	λ Capricorni	5.4	11 40	21 00 37.4	-3 12.6	+0.932	0.553	0.242	+79 +9
336	170 B. Aquarii	6.1	-7 31	21 17 24.1	-11 00.2	+0.952	0.545	+0.255	+83 +10
337	κ Aquarii	5.3	4 34	21 23 57.7	-4 39.8	-0.342	0.543	0.258	+24 -62
338	6 G. Piscium	6.2	2 44	22 09 29.1	+4 32.7	+0.297	0.540	0.261	+59 -27
339	22 B. Piscium	6.5	-0 04	22 21 18.8	-8 00.9	+0.682	0.538	0.261	+89 -6
340	9 Piscium	6.4	+0 46	22 23 03.5	-6 19.6	+0.298	0.538	0.261	+59 -26
341	19 Piscium	5.3	+3 08	23 08 03.5	+2 22.6	+0.246	0.538	+0.258	+56 -29
342	136 B. Piscium	6.5	9 00	24 09 41.5	+3 10.1	+0.723	0.541	0.242	+90 -2
343	75 Piscium	6.2	12 37	24 21 22.4	-9 32.3	-0.204	0.545	0.230	+31 -49
344	i Arietis	5.2	17 30	25 20 16.5	-11 25.2	-0.320	0.553	0.197	+25 -51
345	47 B. Arietis	6.5	17 43	26 00 53.0	-6 58.3	+0.345	0.555	0.190	+63 -15
346	θ Arietis	5.7	+19 36	26 05 25.6	-2 35.3	-0.757	0.557	+0.181	0 -71
347	26 Arietis	6.1	19 34	26 10 53.0	+2 40.5	+0.239	0.560	0.171	+56 -19
348	e Arietis (mean)	4.6	21 05	26 23 10.8	-9 28.1	+0.619	0.565	0.146	+87 +4
349	66 Arietis	6.1	22 35	27 11 33.3	+2 27.3	+0.689	0.569	0.118	+90 +11
350	18 Tauri	5.6	24 38	27 18 32.7	+9 11.2	-0.699	0.571	0.101	+2 -65
351	36 Tauri	5.7	+23 56	28 02 33.5	-7 06.0	+0.772	0.573	+0.081	+90 +19
JULY									
352	d ^a Cancrī	6.2	+17 16	2 21 06.0	+7 23.7	+1.194	0.527	-0.177	+90 +38
353	54 Cancrī	6.3	15 36	3 09 43.5	-4 22.0	+0.686	0.519	0.193	+90 +1
354	89 B. Leonis	6.3	8 37	4 21 12.2	+6 05.3	+0.896	0.500	0.225	+90 +8
355	43 Leonis	6.3	6 52	5 10 55.2	-4 34.4	-0.299	0.496	0.232	+27 -58
356	155 B. Leonis	6.5	+6 01	5 11 03.8	-4 26.0	+0.608	0.495	0.232	+82 -9
357	388 B. Leonis	6.3	-1 21	6 23 24.0	+6 55.4	+0.182	0.491	-0.238	+52 -33
358	e Leonis	5.1	2 39	7 00 45.8	+8 15.0	+1.300	0.491	0.238	+88 +37
359	q Virginis	5.4	9 06	8 11 57.9	-5 30.6	+0.188	0.500	0.227	+50 -32
360	370 B. Virginis	6.0	11 18	8 22 58.9	+5 11.8	+0.144	0.505	0.220	+47 -34
361	75 Virginis	5.6	15 02	9 18 57.3	+0 35.0	-0.005	0.518	0.202	+36 -42
362	83 Virginis	5.7	-15 52	10 00 47.2	+6 14.2	-0.270	0.522	-0.195	+21 -58
363	87 Virginis	5.8	17 32	10 02 13.6	+7 38.0	+1.272	0.523	-0.194	+73 +40
364	236 G. Virginis	5.7	18 25	10 17 21.6	-1 42.7	-0.565	0.535	0.173	+3 -80
365	9 G. Libræ	6.5	20 10	11 00 56.2	+5 37.0	+0.032	0.541	0.161	+32 -40
366	43 B. Libræ	5.8	21 08	11 11 11.8	-8 28.2	-0.498	0.550	0.143	+3 -75
367	47 G. Libræ	6.1	-21 47	11 15 13.7	-4 34.7	-0.363	0.554	-0.136	+9 -63
368	153 B. Libræ	6.3	24 16	12 02 49.1	+6 36.1	+0.832	0.564	0.111	+66 +6
369	A Scorpii	4.7	25 08	12 11 27.0	-9 05.1	+0.858	0.571	0.092	+65 +8
370	31 B. Scorpii	5.4	24 21	12 11 34.6	-8 57.7	+0.015	0.571	0.091	+24 -41
371	32 B. Scorpii	5.4	23 47	12 11 35.8	-8 56.6	-0.568	0.571	0.091	-6 -82
372	3 Scorpii	5.9	-25 03	12 11 53.2	-8 39.8	+0.732	0.571	-0.090	+65 0
373	40 B. Scorpii	5.4	24 39	12 13 31.3	+7 05.4	+0.160	0.573	0.087	+31 -33
374	48 B. Scorpii	5.1	25 41	12 15 29.0	-5 12.0	+1.082	0.574	0.082	+65 +26
375	24 G. Scorpii	6.2	24 18	12 17 21.6	-3 23.7	-0.524	0.576	0.077	-6 -78
376	a Sco. (Antares)	1.2	26 18	13 02 05.7	+5 00.4	+0.979	0.582	0.054	+64 +17
377	22 Scorpii	4.9	-24 59	13 02 25.9	+5 19.8	-0.405	0.582	-0.054	-2 -69
378	116 B. Scorpii	6.2	26 24	13 02 53.3	+5 46.1	+1.048	0.582	0.052	+64 +23
379	118 B. Ophiuchi	6.2	26 26	13 16 57.6	-4 42.8	+0.605	0.590	0.013	+53 -7
380	36 Oph. (1st star)	5.3	26 31	13 20 16.7	-1 31.6	+0.660	0.592	-0.004	+57 -4
381	136 G. Ophiuchi	6.3	25 53	14 00 46.2	+2 47.1	+0.033	0.594	+0.009	+17 -40
382	λ Sagittarii	2.9	-25 28	15 00 16.3	+1 19.9	+0.621	0.597	+0.078	+58 -7
383	18 Aquarii	5.5	13 09	17 22 53.5	-2 47.9	+0.110	0.567	0.235	+43 -36
384	137 B. Capricorni	6.2	10 52	18 05 27.3	+3 31.7	-0.585	0.563	0.243	+8 -80
385	λ Capricorni	5.4	-11 40	18 08 30.3	+6 28.1	+0.950	0.562	+0.246	+79 +10

Full Moon—June 16^d 20^hNew Moon—June 30^d 20^hLast Quarter—June 23^d 14^hFirst Quarter—July 8^d 22^hFull Moon—July 16^d 05^h

ELEMENTS OF OCCULTATIONS, 1935

549

No.	Star's Name	Mag.	Dec.	T_0	H	Y	x'	y'	Limiting Parallels
JULY									
386	96 B. Aquarii	6.5	-10° 37'	18 11 34.9	+ 9 26.2	+0.676	0.560	+0.250	+79° - 8
387	θ Aquarii	4.3	8 06	18 21 48.2	- 4 42.2	+0.783	0.555	0.258	+82 - 1
388	ρ Aquarii	5.4	8 09	18 23 17.9	- 3 15.6	+1.209	0.555	0.258	+82 +29
389	170 B. Aquarii	6.1	7 31	19 00 47.1	- 1 49.5	+0.975	0.554	0.259	+83 +11
390	186 B. Aquarii	6.2	6 53	19 04 14.9	+ 1 31.0	+1.246	0.553	0.261	+84 +32
391	207 B. Aquarii	6.4	- 3 53	19 08 31.2	+ 5 38.5	-0.608	0.551	+0.263	+10 -81
392	6 G. Piscium	6.2	- 2 44	19 16 24.1	-10 44.7	+0.332	0.549	0.265	+61 -25
393	δ Piscium	5.6	+ 7 50	21 06 04.5	+ 1 39.5	-0.402	0.545	0.252	+21 -64
394	136 B. Piscium	6.5	9 00	21 15 30.0	+10 46.0	+0.755	0.546	0.244	+90 0
395	101 Piscium	6.2	14 20	22 16 09.1	+10 34.7	+0.999	0.551	0.213	+90 +19
396	105 Piscium	6.1	+16 05	22 17 53.0	-11 45.0	-0.423	0.552	+0.210	+20 -59
397	4 Arietis	5.7	16 38	22 21 40.0	- 8 05.9	-0.210	0.553	0.204	+31 -46
398	ι Arietis	5.2	17 30	23 01 43.6	- 4 10.8	-0.287	0.554	0.197	+27 -50
399	7 Tauri	5.9	24 15	24 19 36.4	-11 47.8	-0.746	0.567	0.111	0 -66
400	16 Tauri	5.4	24 05	24 23 59.0	- 7 34.8	-0.116	0.568	0.100	+35 -30
401	17 Tauri	3.8	+23 55	25 00 01.0	- 7 33.0	+0.073	0.568	+0.100	+46 -20
402	104 B. Tauri	5.5	23 14	25 01 29.2	- 6 08.0	+0.940	0.568	0.096	+90 +28
403	36 Tauri	5.7	+23 56	25 08 13.1	+ 0 21.1	+0.794	0.569	+0.080	+90 +20
AUGUST									
404	13 B. Virginis	5.8	- 4 58	3 19 23.8	+ 4 21.9	+1.153	0.493	-0.236	+86 +24
405	69 Virginis	4.9	15 38	5 23 42.2	+ 7 12.6	+1.271	0.512	0.203	+75 +38
406	83 Virginis	5.7	15 52	6 08 25.5	- 8 19.8	-0.225	0.517	0.194	+24 -55
407	9 G. Libræ	6.5	20 10	7 09 03.6	- 8 27.8	+0.081	0.535	0.160	+35 -38
408	17 G. Libræ	6.4	20 54	7 14 22.7	- 3 19.1	+0.062	0.539	0.151	+33 -39
409	18 G. Libræ	6.1	-21 04	7 14 51.8	- 2 51.0	+0.153	0.540	-0.150	+38 -34
410	43 B. Libræ	5.8	21 08	7 19 33.4	+ 1 41.3	-0.454	0.543	0.142	+ 5 -71
411	47 G. Libræ	6.1	21 47	7 23 41.1	+ 5 40.6	-0.319	0.547	0.134	+11 -62
412	153 B. Libræ	6.3	24 16	8 11 33.8	- 6 51.4	+0.889	0.556	0.110	+66 +10
413	δ Scorpii	4.7	25 08	8 20 24.7	+ 1 40.6	+0.914	0.563	0.090	+65 +12
414	31 B. Scorpii	5.4	-24 21	8 20 32.5	+ 1 48.1	+0.062	0.563	-0.090	+26 -39
415	3 Scorpii	5.9	25 03	8 20 51.5	+ 2 06.4	+0.787	0.563	0.089	+65 + 3
416	40 B. Scorpii	5.4	24 39	8 22 32.1	+ 3 43.4	+0.208	0.565	0.085	+34 -30
417	50 B. Scorpii	6.4	24 33	9 00 47.9	+ 5 54.2	-0.081	0.566	0.080	+18 -47
418	24 G. Scorpii	6.2	24 18	9 02 28.2	+ 7 30.8	-0.484	0.568	0.076	- 4 -75
419	α Sco. (Antares)	1.2	-26 18	9 11 25.4	- 7 52.0	+1.033	0.574	-0.054	+64 +22
420	22 Scorpii	4.9	24 59	9 11 46.1	- 7 32.1	-0.365	0.574	0.053	+ 1 -66
421	116 B. Scorpii	6.2	26 24	9 12 14.1	- 7 05.1	+1.103	0.574	0.052	+64 +28
422	118 B. Ophiuchi	6.2	26 26	10 02 38.2	+ 6 45.9	+0.651	0.583	0.014	+57 - 5
423	137 B. Ophiuchi	6.3	25 11	10 04 47.4	+ 8 50.0	-0.668	0.584	0.008	-20 -90
424	36 Oph. (1st star)	5.3	-26 31	10 06 01.7	+10 01.5	+0.705	0.584	-0.004	+62 - 1
425	136 G. Ophiuchi	6.3	25 53	10 10 37.0	- 9 34.0	+0.071	0.586	+0.009	+19 -38
426	151 G. Ophiuchi	6.0	26 13	10 12 31.0	- 7 44.5	+0.437	0.587	0.014	+41 -17
427	67 B. Sagittarii	6.4	25 38	11 06 54.6	+ 9 55.2	+0.569	0.592	0.067	+54 -10
428	70 B. Sagittarii	6.4	24 57	11 08 01.3	+10 59.1	-0.052	0.592	0.070	+18 -45
429	λ Sagittarii	2.9	-25 28	11 10 31.6	-10 36.6	+0.653	0.592	+0.077	+61 - 5
430	24 Sagittarii	5.7	24 05	11 12 50.7	- 8 23.0	-0.558	0.592	0.084	- 7 -81
431	117 B. Sagittarii	5.8	23 34	11 14 39.0	- 6 39.1	-0.930	0.592	0.089	-28 -90
432	26 Sagittarii	6.1	23 54	11 15 56.9	- 5 24.3	-0.474	0.592	0.092	- 2 -74
433	126 B. Sagittarii	5.8	25 05	11 17 05.4	- 4 18.6	+0.829	0.592	0.096	+65 + 6
434	154 B. Sagittarii	5.9	-23 16	11 21 28.0	- 0 06.5	-0.564	0.592	+0.108	- 5 -82
435	168 B. Sagittarii	6.3	22 47	11 23 39.8	+ 2 00.0	-0.794	0.592	0.114	-18 -90
436	191 B. Sagittarii	6.5	23 18	12 02 26.0	+ 4 39.6	+0.041	0.591	0.121	+28 -40
437	50 Sagittarii	5.6	21 54	12 09 19.9	+11 17.0	-0.452	0.590	0.139	+ 4 -71
438	253 B. Sagittarii	6.0	21 27	12 11 08.3	-10 58.9	-0.654	0.590	0.144	- 7 -90
439	ρ Capricorni	5.0	-18 02	13 10 15.6	+11 14.1	-0.081	0.582	+0.197	+29 -47
440	θ Aquarii	4.3	- 8 06	15 07 29.2	+ 6 46.8	+0.738	0.563	+0.260	+82 - 3

Last Quarter—July 22^d 20^hNew Moon—July 30^d 10^hFirst Quarter—Aug. 7^d 13^hFull Moon—Aug. 14^d 13^hLast Quarter—Aug. 21^d 03^h

No.	Star's Name	Mag.	Dec.	T_0	H	Y	x'	y'	Limiting Parallels
AUGUST									
441	κ Piscium	4.9	+ 0 54	^d 16 ^h 14 ^m 13.4	-11 34.1	+0.099	0.556	+0.268	+47 -37
442	9 Piscium	6.4	0 46	16 14 21.8	-11 26.0	+0.268	0.556	0.268	+57 -28
443	16 Piscium	5.6	1 45	16 18 25.1	-7 31.2	+0.394	0.555	0.267	+65 -21
444	λ Piscium	4.6	1 26	16 20 55.6	-5 05.9	+1.379	0.555	0.266	+79 +50
445	δ Piscium	5.6	7 50	17 14 01.2	+11 24.0	-0.473	0.555	0.256	+18 -69
446	136 B. Piscium	6.5	+ 9 00	17 23 08.0	-3 48.3	+0.661	0.555	+0.248	+87 -5
447	η Piscium	3.7	15 01	18 21 09.3	-6 33.5	-0.203	0.559	0.219	+31 -47
448	101 Piscium	6.2	14 20	18 23 01.5	-4 45.4	+0.891	0.560	0.216	+90 +12
449	105 Piscium	6.1	16 05	19 00 42.5	-3 08.0	-0.510	0.560	0.213	+15 -65
450	3 Arietis	6.5	17 06	19 03 41.6	-0 15.2	-0.905	0.560	0.208	-9 -73
451	35 B. Arietis	6.4	+17 57	19 11 04.2	+6 51.5	-0.288	0.562	+0.195	+26 -49
452	θ Arietis	5.7	19 36	19 17 14.1	-11 12.0	-0.814	0.564	0.183	-3 -71
453	26 Arietis	6.1	19 34	19 22 33.9	-6 03.8	+0.166	0.565	0.172	+52 -22
454	μ Arietis	5.7	19 44	20 03 32.5	-1 16.1	+0.826	0.566	0.162	+90 +14
455	ϵ Arietis (mean)	4.6	21 05	20 10 38.7	+5 34.5	+0.539	0.568	0.146	+78 0
456	66 Arietis	6.1	+22 35	20 22 53.7	-6 37.6	+0.608	0.570	+0.117	+86 +6
457	104 B. Tauri	5.5	23 14	21 07 11.7	+1 21.9	+0.834	0.570	0.097	+90 +21
458	27 Tauri	3.8	23 52	21 07 31.7	+1 41.2	+0.206	0.570	0.096	+55 -13
459	36 Tauri	5.7	23 56	21 13 51.6	+7 46.9	+0.692	0.571	0.080	+90 +14
460	χ Tauri	5.4	25 29	21 21 25.8	-8 55.8	-0.398	0.571	+0.061	+20 -43
461	118 Tauri	5.4	+25 06	23 01 25.0	-5 58.7	+0.709	0.566	-0.011	+90 +22
462	ϵ Geminorum	3.2	25 12	24 09 51.3	+1 18.3	-1.022	0.552	0.088	-20 -65
463	ω Geminorum	5.2	24 19	24 18 12.1	+9 22.0	-0.869	0.548	0.106	-9 -66
464	8 Geminorum	3.5	22 06	25 02 21.7	-6 44.9	+0.603	0.543	0.122	+85 +5
465	58 Geminorum	6.0	+23 04	25 03 54.1	-5 15.5	-0.642	0.542	0.125	+6 -64
SEPTEMBER									
466	231 G. Virginis	6.4	-18 17	3 07 01.8	-8 25.8	-0.365	0.526	-0.171	+13 -64
467	236 G. Virginis	5.7	18 25	3 07 48.2	-7 40.8	-0.352	0.527	-0.170	+14 -63
468	9 G. Libræ	6.5	20 10	3 15 39.6	-0 04.3	+0.258	0.532	0.158	+44 -28
469	17 G. Libræ	6.4	20 54	3 21 04.0	+5 09.7	+0.240	0.535	0.149	+42 -29
470	47 G. Libræ	6.1	21 47	4 06 32.9	-9 40.0	-0.143	0.542	0.132	+20 -50
471	64 G. Libræ	5.7	-22 10	4 11 06.9	-5 15.2	-0.316	0.545	-0.124	+10 -61
472	153 B. Libræ	6.3	24 16	4 18 41.2	+2 03.7	+1.079	0.550	0.109	+66 +25
473	42 Libræ	5.1	23 37	4 21 52.8	+5 08.7	+0.030	0.552	0.102	+26 -40
474	Δ Scorpii	4.7	25 08	5 03 45.4	+10 48.9	+1.104	0.556	0.089	+65 +28
475	3 Scorpii	5.9	25 03	5 04 12.9	+11 15.5	+0.975	0.556	0.088	+65 +17
476	50 B. Scorpii	6.4	-24 33	5 08 15.6	-8 50.4	+0.097	0.559	-0.079	+27 -36
477	24 G. Scorpii	6.2	24 18	5 09 58.6	-7 11.0	+0.312	0.560	0.075	+6 -61
478	σ Scorpii	3.1	25 26	5 15 41.6	-1 40.4	+0.520	0.564	0.062	+51 -12
479	α Sco. (Antares)	1.2	26 18	5 19 11.1	+1 41.4	+1.222	0.566	0.053	+64 +44
480	22 Scorpii	4.9	24 59	5 19 32.4	+2 02.0	-0.194	0.566	0.052	+9 -54
481	118 B. Ophiuchi	6.2	-26 26	6 10 52.0	-7 12.5	+0.830	0.574	-0.014	+64 +7
482	36 Oph. (1st star)	5.3	26 31	6 14 22.0	-3 50.4	+0.883	0.575	-0.004	+64 +11
483	151 G. Ophiuchi	6.0	26 13	6 21 04.0	+2 36.3	+0.608	0.577	+0.013	+53 -7
484	67 B. Sagittarii	6.4	25 38	7 16 03.7	-3 07.8	+0.728	0.582	0.065	+65 0
485	70 B. Sagittarii	6.4	24 57	7 17 12.5	-2 01.7	+0.098	0.582	0.068	+26 -36
486	λ Sagittarii	2.9	-25 28	7 19 47.7	+0 27.5	+0.810	0.582	+0.075	+65 +5
487	24 Sagittarii	5.7	24 05	7 22 11.2	+2 45.5	+0.419	0.582	0.081	0 -69
488	26 Sagittarii	6.1	23 54	8 01 23.3	+5 50.1	-0.337	0.582	0.090	+5 -63
489	126 B. Sagittarii	5.8	25 05	8 02 33.9	+6 58.0	+0.983	0.582	0.093	+65 +17
490	154 B. Sagittarii	5.9	23 16	8 07 04.6	+11 18.2	-0.433	0.582	0.105	+1 -70
491	168 B. Sagittarii	6.3	-22 47	8 09 20.4	-10 31.3	-0.668	0.582	+0.111	-10 -90
492	191 B. Sagittarii	6.5	23 18	8 12 11.6	-7 46.7	+0.175	0.582	0.118	+35 -32
493	222 B. Sagittarii	5.6	22 31	8 16 59.5	-3 10.0	-0.012	0.582	0.130	+26 -43
494	50 Sagittarii	5.6	21 54	8 19 17.4	-0 57.5	+0.332	0.582	0.136	+10 -62
495	253 B. Sagittarii	6.0	-21 27	8 21 08.7	+0 49.6	-0.538	0.581	+0.141	0 -78

Full Moon—Aug. 14^d 13^h
New Moon—Aug. 29^d 01^h

Last Quarter—Aug. 21^d 03^h
First Quarter—Sept. 6^d 02^h

ELEMENTS OF OCCULTATIONS, 1935

551

No.	Star's Name	Mag.	Dec.	T_0	H	Y	x'	y'	Limiting Parallels
SEPTEMBER									
496	α Capricorni	5.5	-19 19	$\begin{smallmatrix} d & h & m \\ 9 & 16 & 54.3 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -4 & 10.2 \end{smallmatrix}$	+0.559	0.577	+0.186	+64 -11
497	π Capricorni	5.2	18 25	$\begin{smallmatrix} h & m \\ 9 & 20 & 10.4 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -1 & 01.6 \end{smallmatrix}$	+0.280	0.576	0.192	+48 -27
498	12 Capricorni	6.1	18 48	$\begin{smallmatrix} h & m \\ 9 & 21 & 13.9 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -0 & 00.4 \end{smallmatrix}$	+0.858	0.576	0.194	+72 +6
499	47 B. Capricorni	6.2	16 45	$\begin{smallmatrix} h & m \\ 9 & 23 & 34.6 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +2 & 15.0 \end{smallmatrix}$	-0.723	0.575	0.199	-4 -90
500	94 B. Capricorni	6.0	16 17	$\begin{smallmatrix} h & m \\ 10 & 08 & 46.7 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +11 & 06.4 \end{smallmatrix}$	+0.724	0.572	0.216	+74 -3
501	53 B. Aquarii	6.5	-13 28	$\begin{smallmatrix} h & m \\ 10 & 16 & 28.7 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -5 & 28.7 \end{smallmatrix}$	-0.345	0.570	+0.228	+19 -62
502	18 Aquarii	5.5	13 09	$\begin{smallmatrix} h & m \\ 10 & 19 & 56.0 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -2 & 09.1 \end{smallmatrix}$	+0.143	0.569	0.234	+45 -34
503	λ Capricorni	5.4	11 40	$\begin{smallmatrix} h & m \\ 11 & 05 & 25.5 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +6 & 59.7 \end{smallmatrix}$	-0.951	0.567	0.246	+79 +10
504	θ Aquarii	4.3	8 06	$\begin{smallmatrix} h & m \\ 11 & 18 & 25.6 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -4 & 28.5 \end{smallmatrix}$	+0.744	0.564	0.259	+82 -3
505	ρ Aquarii	5.4	-8 08	$\begin{smallmatrix} h & m \\ 11 & 19 & 52.8 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -3 & 04.4 \end{smallmatrix}$	+1.160	0.564	0.260	+82 +25
506	η Piscium	3.7	+15 01	$\begin{smallmatrix} h & m \\ 15 & 06 & 20.2 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +4 & 25.3 \end{smallmatrix}$	-0.354	0.570	+0.221	+23 -56
507	101 Piscium	6.2	14 20	$\begin{smallmatrix} h & m \\ 15 & 08 & 08.7 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +6 & 09.8 \end{smallmatrix}$	+0.720	0.570	0.218	+90 +2
508	4 Arietis	5.7	16 38	$\begin{smallmatrix} h & m \\ 15 & 13 & 19.8 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +11 & 09.4 \end{smallmatrix}$	-0.462	0.571	0.209	+17 -61
509	1 Arietis	5.2	17 30	$\begin{smallmatrix} h & m \\ 15 & 17 & 09.0 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -9 & 09.9 \end{smallmatrix}$	-0.542	0.572	0.202	+13 -65
510	35 B. Arietis	6.4	17 57	$\begin{smallmatrix} h & m \\ 15 & 19 & 47.6 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -6 & 37.2 \end{smallmatrix}$	-0.455	0.573	0.197	+17 -59
511	47 B. Arietis	6.5	+17 44	$\begin{smallmatrix} h & m \\ 15 & 21 & 28.7 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -4 & 59.9 \end{smallmatrix}$	+0.095	0.573	+0.194	+47 -28
512	20 H. Arietis	6.4	16 56	$\begin{smallmatrix} h & m \\ 15 & 22 & 09.0 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -4 & 21.1 \end{smallmatrix}$	+1.026	0.574	0.192	+90 +24
513	θ Arietis	5.7	19 36	$\begin{smallmatrix} h & m \\ 16 & 01 & 45.3 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -0 & 53.0 \end{smallmatrix}$	-0.980	0.574	0.185	-15 -71
514	26 Arietis	6.1	19 34	$\begin{smallmatrix} h & m \\ 16 & 06 & 54.6 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +4 & 04.7 \end{smallmatrix}$	-0.021	0.576	0.174	+41 -32
515	μ Arietis	5.7	19 44	$\begin{smallmatrix} h & m \\ 16 & 11 & 43.4 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +8 & 42.6 \end{smallmatrix}$	+0.624	0.577	0.164	+86 +3
516	ϵ Arietis (mean)	4.6	+21 05	$\begin{smallmatrix} h & m \\ 16 & 18 & 36.0 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -8 & 40.5 \end{smallmatrix}$	+0.336	0.578	+0.148	+62 -11
517	66 Arietis	6.1	22 35	$\begin{smallmatrix} h & m \\ 17 & 06 & 28.4 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +2 & 44.7 \end{smallmatrix}$	+0.396	0.579	0.119	+67 -5
518	7 Tauri	5.9	24 15	$\begin{smallmatrix} h & m \\ 17 & 08 & 53.4 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +5 & 04.2 \end{smallmatrix}$	-1.030	0.579	0.113	-21 -66
519	16 Tauri	5.4	24 05	$\begin{smallmatrix} h & m \\ 17 & 13 & 05.4 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +9 & 06.5 \end{smallmatrix}$	-0.416	0.579	0.102	+19 -47
520	7 Tauri	4.4	24 16	$\begin{smallmatrix} h & m \\ 17 & 13 & 15.1 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +9 & 15.9 \end{smallmatrix}$	-0.583	0.579	0.101	+9 -58
521	20 Tauri	4.0	+24 10	$\begin{smallmatrix} h & m \\ 17 & 13 & 30.2 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +9 & 30.4 \end{smallmatrix}$	-0.456	0.579	+0.101	+16 -50
522	21 Tauri	5.8	24 21	$\begin{smallmatrix} h & m \\ 17 & 13 & 32.0 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +9 & 32.2 \end{smallmatrix}$	-0.645	0.579	0.101	+5 -62
523	22 Tauri	6.5	24 20	$\begin{smallmatrix} h & m \\ 17 & 13 & 35.5 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +9 & 35.5 \end{smallmatrix}$	-0.612	0.579	0.100	+7 -60
524	104 B. Tauri	5.5	23 14	$\begin{smallmatrix} h & m \\ 17 & 14 & 32.0 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +10 & 29.8 \end{smallmatrix}$	+0.616	0.579	0.098	+87 +9
525	33 Tauri	6.0	23 00	$\begin{smallmatrix} h & m \\ 17 & 18 & 04.2 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -10 & 06.1 \end{smallmatrix}$	+1.190	0.579	0.089	+90 +49
526	36 Tauri	5.7	+23 56	$\begin{smallmatrix} h & m \\ 17 & 21 & 01.0 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -7 & 16.1 \end{smallmatrix}$	+0.473	0.579	+0.081	+73 +3
527	χ Tauri	5.4	25 29	$\begin{smallmatrix} h & m \\ 18 & 04 & 23.7 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -0 & 10.3 \end{smallmatrix}$	-0.604	0.578	0.062	+7 -57
528	62 Tauri	6.2	24 09	$\begin{smallmatrix} h & m \\ 18 & 04 & 59.1 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +0 & 23.7 \end{smallmatrix}$	+0.809	0.578	0.060	+90 +23
529	δ Tauri	5.6	24 57	$\begin{smallmatrix} h & m \\ 18 & 18 & 55.6 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -10 & 11.6 \end{smallmatrix}$	-0.560	0.575	+0.023	+82 +13
530	118 Tauri	5.4	25 06	$\begin{smallmatrix} h & m \\ 19 & 07 & 48.3 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +2 & 12.1 \end{smallmatrix}$	+0.488	0.571	-0.011	+75 +10
531	139 Tauri	4.9	+25 57	$\begin{smallmatrix} h & m \\ 19 & 19 & 53.8 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -10 & 09.0 \end{smallmatrix}$	-0.724	0.565	-0.041	0 -64
532	5 Geminorum	5.9	24 26	$\begin{smallmatrix} h & m \\ 20 & 01 & 43.0 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -4 & 32.5 \end{smallmatrix}$	+0.608	0.562	0.055	+87 +12
533	87 B. Geminorum	5.8	23 41	$\begin{smallmatrix} h & m \\ 20 & 19 & 29.0 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -11 & 24.1 \end{smallmatrix}$	+0.084	0.552	0.095	+47 -19
534	44 Geminorum	5.9	22 44	$\begin{smallmatrix} h & m \\ 21 & 01 & 29.6 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -5 & 35.9 \end{smallmatrix}$	+0.496	0.548	0.108	+75 +1
535	8 Geminorum	3.5	22 06	$\begin{smallmatrix} h & m \\ 21 & 08 & 17.2 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +0 & 58.0 \end{smallmatrix}$	+0.407	0.543	0.121	+68 -5
536	58 Geminorum	6.0	+23 04	$\begin{smallmatrix} h & m \\ 21 & 09 & 49.3 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +2 & 27.1 \end{smallmatrix}$	-0.832	0.542	-0.124	-6 -67
537	149 B. Geminorum	6.4	21 40	$\begin{smallmatrix} h & m \\ 21 & 11 & 24.9 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +3 & 59.5 \end{smallmatrix}$	+0.494	0.541	0.127	+75 -2
538	63 Geminorum	5.3	21 35	$\begin{smallmatrix} h & m \\ 21 & 11 & 49.6 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +4 & 23.4 \end{smallmatrix}$	+0.537	0.541	0.128	+78 +1
539	85 Geminorum	5.4	20 03	$\begin{smallmatrix} h & m \\ 22 & 01 & 04.0 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -6 & 48.0 \end{smallmatrix}$	+0.354	0.532	0.151	+64 -12
540	217 B. Geminorum	6.3	20 00	$\begin{smallmatrix} h & m \\ 22 & 03 & 32.8 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +4 & 24.0 \end{smallmatrix}$	-0.043	0.531	0.155	+44 -28
541	10 H. Cancr	6.1	+19 02	$\begin{smallmatrix} h & m \\ 22 & 05 & 28.8 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -2 & 31.6 \end{smallmatrix}$	+0.801	0.530	-0.158	+90 +12
542	54 Cancr	6.3	15 36	$\begin{smallmatrix} h & m \\ 23 & 04 & 40.1 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -4 & 02.9 \end{smallmatrix}$	+0.539	0.516	0.189	+77 -7
543	1 Leonis	5.1	+11 35	$\begin{smallmatrix} h & m \\ 24 & 02 & 11.2 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -7 & 09.4 \end{smallmatrix}$	+0.646	0.506	0.211	+86 -4
OCTOBER									
544	43 B. Libræ	5.8	-21 08	$\begin{smallmatrix} h & m \\ 1 & 07 & 56.8 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -6 & 20.4 \end{smallmatrix}$	-0.062	0.540	-0.139	+25 -45
545	64 G. Libræ	5.7	22 10	$\begin{smallmatrix} h & m \\ 1 & 16 & 45.8 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +2 & 11.1 \end{smallmatrix}$	-0.089	0.545	0.122	+22 -47
546	32 B. Scorpii	5.4	23 47	$\begin{smallmatrix} h & m \\ 2 & 09 & 42.1 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -5 & 27.2 \end{smallmatrix}$	-0.114	0.555	0.088	+17 -49
547	40 B. Scorpii	5.4	24 39	$\begin{smallmatrix} h & m \\ 2 & 11 & 45.1 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -3 & 28.6 \end{smallmatrix}$	+0.637	0.556	0.083	+61 -6
548	50 B. Scorpii	6.4	24 33	$\begin{smallmatrix} h & m \\ 2 & 14 & 06.3 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ -1 & 12.3 \end{smallmatrix}$	+0.343	0.557	0.078	+41 -22
549	41 G. Scorpii	6.3	-24 16	$\begin{smallmatrix} h & m \\ 2 & 18 & 25.3 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +2 & 57.6 \end{smallmatrix}$	-0.285	0.559	-0.068	+6 -59
550	α Scorpii	3.1	-25 26	$\begin{smallmatrix} h & m \\ 2 & 21 & 38.5 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ +6 & 03.9 \end{smallmatrix}$	+0.775	0.561	-0.061	+65 +3

Full Moon—Sept. 12^d 20^h
New Moon—Sept. 27^d 17^h

Last Quarter—Sept. 19^d 14^h
First Quarter—Oct. 5^d 14^h

ELEMENTS OF OCCULTATIONS, 1935

No.	Star's Name	Mag.	Dec.	T_0	H	Y	x'	y'	Limiting Parallels
OCTOBER									
551	118 B. Ophiuchi	6.2	-26 26	^d 3 17 10.3	^h 0 53.3	+1.098	0.568	-0.013	+64 +29
552	137 B. Ophiuchi	6.3	25 11	^m 3 19 26.6	+ 3 04.6	-0.255	0.569	-0.007	+ 2 -57
553	9 Ophiuchi	3.4	24 56	3 23 33.3	+ 7 02.2	-0.518	0.570	+0.003	-12 -78
554	136 G. Ophiuchi	6.3	25 53	4 01 36.1	+ 9 00.5	+0.501	0.571	0.008	+45 -13
555	151 G. Ophiuchi	6.0	26 13	4 03 36.8	+10 56.7	+0.876	0.571	0.014	+64 +10
556	63 Ophiuchi	6.1	-24 53	4 13 17.0	- 3 44.7	-0.295	0.573	+0.038	+ 3 -60
557	67 B. Sagittarii	6.4	25 38	4 23 08.9	+ 5 45.0	+0.999	0.574	0.004	+65 +19
558	70 B. Sagittarii	6.4	24 57	5 00 19.8	+ 6 53.3	+0.359	0.574	0.067	+41 -21
559	λ Sagittarii	2.9	25 28	5 02 59.9	+ 9 27.3	+1.081	0.574	0.074	+65 +26
560	117 B. Sagittarii	5.8	23 34	5 07 23.4	-10 19.0	-0.551	0.574	0.085	- 6 -80
561	26 Sagittarii	6.1	-23 54	5 08 46.5	- 8 59.1	-0.084	0.573	+0.088	+18 -47
562	ν Sagittarii	5.0	22 50	5 13 53.8	- 4 03.2	-0.710	0.573	0.101	-14 -90
563	ν Sagittarii	5.0	22 45	5 14 17.4	- 3 40.6	-0.746	0.573	0.102	-16 -90
564	154 B. Sagittarii	5.9	23 16	5 14 39.4	- 3 19.4	-0.185	0.573	0.103	+15 -53
565	168 B. Sagittarii	6.3	22 47	5 16 59.9	- 1 04.1	-0.425	0.573	0.108	+ 3 -69
566	191 B. Sagittarii	6.5	-23 18	5 19 57.1	+ 1 46.4	+0.430	0.572	+0.116	+50 -18
567	199 B. Sagittarii	6.4	21 46	5 21 31.2	+ 3 17.0	-0.964	0.572	0.119	-27 -90
568	222 B. Sagittarii	5.6	22 31	6 00 55.2	+ 6 33.4	+0.238	0.572	0.127	+40 -28
569	50 Sagittarii	5.6	21 54	6 03 18.0	+ 8 50.9	+0.090	0.571	0.133	+22 -47
570	f Sagittarii	5.1	19 55	6 11 43.9	- 7 01.9	-0.928	0.570	0.152	-22 -90
571	α Capricorni	5.5	-19 19	7 01 42.4	+ 6 25.8	+0.794	0.566	+0.181	+71 + 3
572	π Capricorni	5.2	18 25	7 05 05.6	+ 9 41.6	+0.507	0.566	0.188	+62 -14
573	ρ Capricorni	5.0	18 02	7 05 45.3	+10 19.9	+0.230	0.566	0.189	+45 -29
574	12 Capricorni	6.1	18 48	7 06 11.4	+10 45.0	+1.092	0.566	0.190	+72 +23
575	47 B. Capricorni	6.2	16 45	7 08 37.2	-10 54.5	-0.518	0.565	0.194	+ 7 -75
576	61 B. Capricorni	5.9	-16 21	7 10 46.4	- 8 49.9	-0.493	0.564	+0.198	+ 8 -73
577	94 B. Capricorni	6.0	16 17	7 18 08.8	- 1 43.5	+0.938	0.563	0.211	+74 +11
578	95 B. Capricorni	6.0	14 44	7 18 36.2	- 1 17.0	-0.524	0.563	0.211	+ 8 -75
579	53 B. Aquarii	6.5	13 28	8 02 06.4	+ 5 57.0	-0.161	0.561	0.223	+28 -51
580	18 Aquarii	5.5	13 09	8 05 40.4	+ 9 23.4	+0.328	0.560	0.228	+55 -24
581	72 B. Aquarii	6.5	-11 51	8 07 26.7	+11 06.0	-0.574	0.560	+0.230	+ 8 -79
582	137 B. Capricorni	6.2	10 52	8 12 21.9	- 8 09.3	-0.404	0.559	0.237	+17 -66
583	ϵ Capricorni	6.2	9 34	8 15 21.3	- 5 16.3	-0.979	0.559	0.240	-15 -90
584	96 B. Aquarii	6.5	10 37	8 18 33.9	- 2 10.4	+0.834	0.558	0.244	+80 + 3
585	θ Aquarii	4.3	8 06	9 04 48.4	+ 7 42.5	+0.884	0.557	0.253	+82 + 6
586	κ Aquarii	5.3	- 4 33	9 14 04.0	- 7 21.4	-0.246	0.557	+0.260	+28 -56
587	207 B. Aquarii	6.4	3 53	9 15 24.7	- 6 03.5	-0.560	0.557	0.260	+12 -77
588	6 G. Piscium	6.2	- 2 44	9 23 07.7	+ 1 23.3	+0.330	0.557	0.263	+60 -24
589	λ Piscium	4.6	+ 1 26	10 18 24.1	- 4 01.0	+1.331	0.560	0.264	+87 +43
590	19 Piscium	5.3	3 08	10 20 18.0	- 2 11.2	+0.159	0.560	0.264	+51 -33
591	η Piscium	3.7	+15 01	12 17 06.0	- 7 00.7	-0.453	0.575	+0.221	+17 -62
592	ϵ Arietis (mean)	4.6	21 05	14 04 36.0	+ 3 07.6	+0.150	0.587	0.148	+50 -20
593	66 Arietis	6.1	22 35	14 16 09.2	- 9 46.4	+0.188	0.589	0.119	+53 -16
594	16 Tauri	5.4	24 06	14 22 35.0	- 3 35.8	-0.624	0.590	0.102	+ 6 -61
595	17 Tauri	3.8	23 55	14 22 36.8	- 3 34.1	-0.442	0.590	0.102	+17 -49
596	η Tauri	4.4	+24 16	14 22 44.5	- 3 26.8	-0.789	0.590	+0.102	- 4 -66
597	20 Tauri	4.0	24 10	14 22 59.2	- 3 12.6	-0.664	0.590	0.101	+ 4 -64
598	21 Tauri	5.8	24 22	14 23 01.0	- 3 10.9	-0.851	0.590	0.101	- 8 -66
599	22 Tauri	6.5	24 20	14 23 04.3	- 3 07.7	-0.818	0.590	0.101	- 6 -66
600	104 B. Tauri	5.5	23 14	14 23 59.2	- 2 15.0	+0.392	0.590	0.098	+67 - 3
601	33 Tauri	6.0	+23 00	15 03 25.3	+ 1 03.0	+0.953	0.590	+0.089	+90 +30
602	161 B. Tauri	6.5	23 01	15 04 57.0	+ 2 31.1	+1.056	0.589	0.085	+90 +38
603	36 Tauri	5.7	23 56	15 06 17.0	+ 3 47.9	+0.241	0.589	0.081	+56 - 9
604	χ Tauri	5.4	25 29	15 13 26.9	+10 40.8	-0.831	0.589	0.061	- 7 -65
605	62 Tauri	6.2	+24 09	15 14 01.2	+11 13.8	+0.562	0.588	+0.060	+82 + 9

New Moon—Sept. 27^d 1^hFirst Quarter—Oct. 5^d 14^hFull Moon—Oct. 12^d 05^h

ELEMENTS OF OCCULTATIONS, 1935

553

No.	Star's Name	Mag.	Dec.	T ₀	H	Y	x'	y'	Limiting Parallels	
OCTOBER										
606	315 B. Tauri	6.3	+24 30	16 02 48.7	- 0 28.8	+0.759	0.585	+0.024	+90	+24
607	h Tauri	5.6	24 57	16 03 33.7	+ 0 14.4	+0.300	0.585	+0.022	+60	- 1
608	118 Tauri	5.4	25 06	16 16 05.0	-11 43.3	+0.217	0.580	-0.012	+55	- 4
609	125 Tauri	5.0	25 52	16 20 20.4	- 7 37.8	-0.653	0.578	0.023	+ 4	-58
610	132 Tauri	5.0	24 33	17 00 10.0	- 3 56.8	+0.618	0.576	0.033	+88	+15
611	412 B. Tauri	6.0	+24 15	17 03 26.7	- 0 47.5	+0.819	0.574	-0.041	+90	+26
612	5 Geminorum	5.9	24 26	17 09 32.5	+ 5 04.7	+0.321	0.570	0.056	+62	- 3
613	8 Geminorum	6.1	24 00	17 11 33.6	+ 7 01.4	+0.672	0.568	0.061	+90	+15
614	52 B. Geminorum	6.4	24 39	17 20 34.5	- 8 17.4	-0.666	0.562	0.082	+ 4	-63
615	44 Geminorum	5.9	22 44	18 08 48.9	+ 3 31.1	+0.201	0.553	0.108	+54	-15
616	58 Geminorum	6.0	+23 04	18 17 00.0	+11 25.4	-1.114	0.547	-0.125	-28	-67
617	149 B. Geminorum	6.4	21 40	18 18 34.0	-11 03.8	+0.199	0.546	0.128	+53	-17
618	63 Geminorum	5.3	21 35	18 18 58.4	-10 40.3	+0.241	0.545	0.128	+56	-15
619	79 Geminorum	6.3	20 28	19 03 03.5	- 2 51.2	+0.340	0.539	0.143	+62	-11
620	85 Geminorum	5.4	20 03	19 08 01.6	+ 1 57.2	+0.062	0.536	0.151	+45	-27
621	217 B. Geminorum	6.3	+20 00	19 10 28.6	+ 4 19.4	-0.246	0.534	-0.155	+28	-44
622	10 H. Cancr	6.1	19 02	19 12 23.2	+ 6 10.4	+0.507	0.532	0.158	+75	- 4
623	d ¹ Cancr	5.9	18 32	19 21 27.5	- 9 02.5	-0.458	0.526	0.171	+17	-58
624	d ² Cancr	6.2	17 16	19 22 41.8	- 7 50.5	+0.726	0.525	0.173	+90	+ 6
625	θ Cancr	5.6	18 19	20 01 32.5	- 5 05.1	-0.921	0.523	0.177	-11	-72
626	54 Cancr	6.3	+15 35	20 11 22.4	+ 4 26.9	+0.260	0.517	-0.189	+57	-21
627	ε Leonis	5.1	11 35	21 08 47.8	+ 1 14.8	+0.391	0.506	0.210	+65	-17
628	83 B. Leonis	5.9	9 14	21 22 02.2	- 9 53.1	+0.144	0.501	0.219	+50	-32
629	155 B. Leonis	6.5	+ 6 01	22 12 49.6	+ 4 29.8	+0.408	0.497	0.227	+66	-19
630	31 B. Scorpii	5.4	-24 21	29 15 12.7	+ 1 50.8	+0.666	0.559	0.086	+63	- 4
631	85 B. Scorpii	6.2	-25 19	30 00 22.3	+10 40.9	+1.011	0.563	-0.066	+65	+21
632	7 Sagittarii	5.5	24 17	31 22 03.9	+ 6 42.1	-0.525	0.573	+0.048	- 8	-78
633	9 Sagittarii	5.9	24 22	31 22 29.5	+ 7 06.7	-0.419	0.573	0.049	- 3	-69
NOVEMBER										
634	MARS	1.1	-24 54	1 03 07.8	+11 34.7	+0.407	0.540	+0.060	+44	-19
635	24 Sagittarii	5.7	24 05	1 11 03.8	- 4 47.0	+0.098	0.572	0.080	+27	-36
636	117 B. Sagittarii	5.8	23 34	1 13 00.5	- 2 54.6	-0.287	0.571	0.085	+ 8	-59
637	26 Sagittarii	6.1	23 54	1 14 24.6	- 1 33.5	+0.184	0.571	0.088	+33	-31
638	μ Sagittarii	5.0	22 50	1 19 36.3	+ 3 26.7	-0.443	0.570	0.101	0	-70
639	ν Sagittarii	5.0	-22 45	1 20 00.2	+ 3 49.7	-0.479	0.570	+0.102	- 1	-73
640	168 B. Sagittarii	6.3	22 47	1 22 45.3	+ 6 28.7	-0.154	0.569	0.108	+17	-51
641	191 B. Sagittarii	6.5	23 18	2 01 45.5	+ 9 22.3	+0.710	0.569	0.115	+67	- 1
642	233 B. Sagittarii	6.0	21 27	2 11 12.4	- 5 31.5	-0.024	0.566	0.136	+26	-43
643	f Sagittarii	5.1	19 55	2 17 51.5	+ 0 53.2	-0.656	0.564	0.150	- 6	-90
644	57 Sagittarii	6.0	-19 13	2 20 22.7	+ 3 18.9	-1.002	0.563	+0.156	-26	-90
645	ρ Capricorni	5.0	18 02	3 12 21.3	- 5 16.6	+0.515	0.558	0.186	+62	-13
646	61 B. Capricorni	5.9	16 21	3 17 31.4	- 0 17.4	-0.220	0.556	0.195	+23	-54
647	95 B. Capricorni	6.0	14 44	4 01 36.0	+ 7 30.3	-0.254	0.554	0.207	+22	-56
648	18 Aquarii	5.5	13 09	4 13 02.4	- 5 26.9	+0.602	0.551	0.223	+73	- 9
649	72 B. Aquarii	6.5	-11 51	4 14 52.4	- 3 40.7	-0.317	0.550	+0.225	+21	-60
650	96 B. Aquarii	6.5	10 37	5 02 23.3	+ 7 26.6	+1.102	0.548	0.238	+80	+22
651	170 B. Aquarii	6.1	7 31	5 16 04.3	- 3 20.0	+1.311	0.547	0.249	+83	+11
652	207 B. Aquarii	6.4	3 53	5 23 59.2	+ 4 18.8	-0.349	0.547	0.254	+23	-62
653	6 G. Piscium	6.2	2 44	6 07 58.4	-11 58.1	+0.539	0.548	0.257	+75	-13
654	22 B. Piscium	6.5	- 0 04	6 19 29.6	- 0 50.4	+0.829	0.550	+0.258	+90	+ 3
655	κ Piscium	4.9	+ 0 54	6 21 02.2	+ 0 30.1	-0.265	0.550	0.258	+50	-28
656	9 Piscium	6.4	0 46	6 21 10.8	+ 0 47.4	+0.436	0.550	0.258	+68	-19
657	16 Piscium	5.6	1 45	7 01 19.5	+ 4 47.7	+0.533	0.551	0.258	+75	-14
658	19 Piscium	5.3	3 08	7 05 50.2	+ 9 09.1	+0.315	0.552	0.257	+59	-25
659	d Piscium	5.6	+ 7 50	7 21 05.6	- 0 07.2	-0.487	0.557	+0.250	+16	-69
660	136 B. Piscium	6.5	+ 9 01	8 06 08.0	+ 8 36.2	+0.580	0.561	+0.243	+79	- 9

Last Quarter—Oct. 19^d 06^h
First Quarter—Nov. 3^d 23^h

New Moon—Oct. 27^d 10^h
Full Moon—Nov. 10^d 15^h

ELEMENTS OF OCCULTATIONS, 1935

No.	Star's Name	Mag.	Dec.	T_0	H	Y	z	y'	Limiting Parallels
NOVEMBER									
661	η Piscium	3.7	+15° 01'	$\begin{smallmatrix} d & h & m \\ 9 & 03 & 37.3 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ + & 5 & 18.7 \end{smallmatrix}$	-0.429	0.572	+0.217	+18 -60
662	ι Arietis	5.2	17 30	$\begin{smallmatrix} h & m \\ 9 & 14 & 21.6 \end{smallmatrix}$	-8 21.0	-0.672	0.578	0.199	+5 -72
663	17 Tauri	3.8	23 55	11 09 10.9	+8 48.2	-0.553	0.594	0.100	+10 -56
664	20 Tauri	4.0	24 10	11 09 33.0	+9 09.4	-0.775	0.594	0.099	-3 -66
665	η Tauri	3.0	23 55	11 10 11.9	+9 46.7	-0.448	0.594	0.098	+16 -49
666	27 Tauri	3.8	+23 52	11 10 51.2	+10 24.4	-0.334	0.594	+0.096	+23 -42
667	χ Tauri	5.4	25 29	11 23 49.9	-1 08.1	-0.970	0.595	0.060	-17 -65
668	103 Tauri	5.5	24 11	12 17 37.7	-8 02.9	+0.978	0.591	+0.010	+90 +39
669	118 Tauri	5.4	25 06	13 01 59.3	-0 01.0	+0.020	0.588	-0.013	+43 -15
670	125 Tauri	5.0	25 52	13 06 09.3	+3 59.2	-0.849	0.586	0.025	-9 -65
671	132 Tauri	5.0	+24 33	13 09 54.0	+7 35.2	+0.403	0.584	-0.035	+68 +3
672	412 B. Tauri	6.0	24 15	13 13 06.4	+10 40.3	+0.598	0.582	0.043	+85 +13
673	5 Geminorum	5.9	24 26	13 19 04.1	-7 35.7	+0.095	0.578	0.058	+47 -15
674	8 Geminorum	6.1	24 00	13 21 02.6	-5 41.7	+0.439	0.577	0.063	+70 +2
675	9 Geminorum	6.3	23 46	13 21 19.1	-5 25.8	+0.660	0.576	0.064	+90 +14
676	36 B. Geminorum	6.0	+23 22	14 00 52.8	-2 00.1	+0.837	0.574	-0.073	+90 +24
677	52 B. Geminorum	6.4	24 39	14 05 51.3	+2 47.4	-0.898	0.570	0.084	-12 -66
678	44 Geminorum	5.9	22 44	14 17 49.2	-9 40.7	-0.055	0.561	0.111	+38 -28
679	8 Geminorum	3.5	22 06	15 00 20.9	-3 22.8	-0.151	0.555	0.124	+33 -35
680	79 Geminorum	6.3	20 28	15 11 40.4	+7 33.5	+0.063	0.546	0.145	+45 -26
681	217 B. Geminorum	6.3	+20 00	15 18 56.4	-9 24.8	-0.524	0.540	-0.157	+13 -60
682	10 H. Cancr	6.1	19 01	15 20 49.1	-7 36.0	+0.221	0.538	0.160	+54 -19
683	α^1 Cancr	5.9	18 32	16 05 43.4	+1 01.2	-0.741	0.531	0.173	0 -72
684	α^2 Cancr	6.2	17 16	16 06 56.4	+2 11.9	+0.432	0.530	0.175	+68 -10
685	54 Cancr	6.3	15 35	16 19 24.9	-9 42.8	-0.034	0.521	0.190	+39 -37
686	ϵ Leonis	5.1	+11 35	17 16 34.3	+10 49.0	+0.095	0.508	-0.210	+47 -33
687	σ Leonis	3.8	10 11	17 21 28.5	-8 25.2	+0.593	0.506	0.214	+80 -7
688	89 B. Leonis	6.3	8 37	18 06 37.1	+0 27.8	+0.333	0.502	0.220	+61 -22
689	π Leonis	4.9	8 21	18 07 45.2	+1 34.1	+0.379	0.501	0.220	+64 -20
690	43 Leonis	6.3	6 52	18 20 15.4	-10 16.5	-0.777	0.497	0.226	0 -84
691	155 B. Leonis	6.5	6 01	18 20 24.0	-10 08.1	+0.128	0.497	-0.226	+49 -34
692	ρ^2 Leonis	5.4	+0 17	20 00 37.0	-6 41.1	-0.003	0.494	0.232	+42 -42
693	η Virginis	5.4	-9 06	21 20 58.6	-11 32.2	+0.254	0.503	0.220	+53 -28
694	75 Virginis	5.6	15 02	23 04 01.2	-5 23.5	+0.298	0.520	0.195	+52 -25
695	85 Virginis	6.2	15 27	23 10 26.6	+0 50.3	-0.480	0.524	0.188	+9 -72
696	231 G. Virginis	6.4	-18 17	24 01 54.1	-8 11.0	-0.131	0.534	-0.167	+25 -49
697	ι Sagittarii	5.1	23 43	28 07 41.1	-6 01.6	-0.778	0.578	+0.059	-22 -90
698	199 B. Sagittarii	6.4	21 46	29 08 56.4	-5 43.0	-0.514	0.572	0.121	-1 -76
699	222 B. Sagittarii	5.6	22 31	29 12 22.3	-2 24.7	+0.700	0.571	0.129	+67 -2
700	50 Sagittarii	5.6	21 54	29 14 46.7	-0 05.6	+0.374	0.570	0.134	+48 -21
701	f Sagittarii	5.1	-19 55	29 23 20.0	+8 09.0	-0.460	0.567	+0.152	+5 -71
702	π Capricorni	5.2	18 25	30 17 06.1	+1 17.0	+1.009	0.559	0.186	+72 +17
703	ρ Capricorni	5.0	18 02	30 17 47.0	+1 56.5	+0.728	0.559	0.187	+72 -1
704	61 B. Capricorni	5.9	16 21	30 22 57.7	+6 56.2	-0.004	0.556	0.195	+34 -41
DECEMBER									
705	53 B. Aquarii	6.5	-13 28	1 14 52.8	-1 41.6	+0.333	0.550	+0.218	+55 -24
706	18 Aquarii	5.5	13 09	1 18 36.3	+1 54.4	+0.830	0.549	0.222	+77 +4
707	137 B. Capricorni	6.2	10 52	2 01 36.7	+8 40.6	+0.077	0.546	0.230	+42 -37
708	44 Aquarii	5.8	5 42	2 19 04.1	+1 33.1	-1.026	0.542	0.244	-17 -90
709	κ Aquarii	5.3	4 33	3 04 43.3	+10 53.2	+0.193	0.541	0.250	+52 -31
710	22 B. Piscium	6.5	-0 04	4 02 09.8	+7 37.4	+1.045	0.541	+0.254	+90 +17
711	κ Piscium	4.9	+0 54	4 03 45.1	+9 09.6	+0.471	0.542	0.254	+70 -17
712	9 Piscium	6.4	0 46	4 03 54.0	+9 18.2	+0.645	0.542	0.254	+84 -7
713	19 Piscium	5.3	3 08	4 12 48.9	-6 04.6	+0.512	0.543	0.252	+73 -14
714	36 Piscium	6.2	7 53	5 02 42.8	+7 21.4	-0.825	0.547	0.246	-3 -83
715	d Piscium	5.6	+7 50	5 04 33.2	+9 08.1	-0.323	0.548	+0.244	+24 -58

First Quarter—Nov. 3^d 23^hLast Quarter—Nov. 18^d 01^hFull Moon—Nov. 10^d 15^hNew Moon—Nov. 26^d 03^hFirst Quarter—Dec. 3^d 07^h

ELEMENTS OF OCCULTATIONS, 1935

555

No.	Star's Name	Mag.	Dec.	T_0	H	Y	x'	y'	Limiting Parallels
DECEMBER									
716	75 Piscium	6.2	+12° 37'	$\begin{smallmatrix} d & h & m \\ 6 & 01 & 10.5 \end{smallmatrix}$	$\begin{smallmatrix} + & h & m \\ + & 5 & 02.9 \end{smallmatrix}$	-0.277	0.557	+0.226	+26° -53°
717	105 Piscium	6.1	16 05	$\begin{smallmatrix} 6 & 15 & 34.9 \end{smallmatrix}$	$\begin{smallmatrix} - & 5 & 03.4 \\ - & 0.657 & 0.565 \end{smallmatrix}$	-0.657	0.565	0.206	+6° -73°
718	4 Arietis	5.7	16 38	$\begin{smallmatrix} 6 & 19 & 13.2 \end{smallmatrix}$	$\begin{smallmatrix} - & 1 & 33.0 \\ - & 0.478 & 0.567 \end{smallmatrix}$	-0.478	0.567	0.201	+16° -61°
719	1 Arietis	5.2	17 30	$\begin{smallmatrix} 6 & 23 & 06.7 \end{smallmatrix}$	$\begin{smallmatrix} + & 2 & 12.0 \\ + & 0.586 & 0.569 \end{smallmatrix}$	-0.586	0.569	0.194	+10° -67°
720	35 B. Arietis	6.4	17 57	$\begin{smallmatrix} 7 & 01 & 47.8 \end{smallmatrix}$	$\begin{smallmatrix} + & 4 & 47.2 \\ + & 0.516 & 0.571 \end{smallmatrix}$	-0.516	0.571	0.190	+13° -63°
721	47 B. Arietis	6.3	+17 44	$\begin{smallmatrix} 7 & 03 & 30.1 \end{smallmatrix}$	$\begin{smallmatrix} + & 6 & 25.8 \\ + & 0.028 & 0.572 \end{smallmatrix}$	+0.028	0.572	+0.186	+43° -31°
722	μ Arietis	5.7	19 45	$\begin{smallmatrix} 7 & 17 & 49.4 \end{smallmatrix}$	$\begin{smallmatrix} - & 3 & 47.1 \\ - & 0.463 & 0.580 \end{smallmatrix}$	+0.463	0.580	0.158	+71° -5°
723	47 Arietis	5.8	20 25	$\begin{smallmatrix} 8 & 00 & 12.5 \end{smallmatrix}$	$\begin{smallmatrix} + & 2 & 21.4 \\ + & 0.745 & 0.583 \end{smallmatrix}$	+0.745	0.583	0.144	+90° +12°
724	ϵ Arietis (<i>mean</i>)	4.6	21 05	$\begin{smallmatrix} 8 & 00 & 40.0 \end{smallmatrix}$	$\begin{smallmatrix} + & 2 & 47.8 \\ + & 0.129 & 0.583 \end{smallmatrix}$	+0.129	0.583	0.143	+49° -21°
725	16 Tauri	5.4	24 06	$\begin{smallmatrix} 8 & 18 & 51.5 \end{smallmatrix}$	$\begin{smallmatrix} - & 3 & 43.2 \\ - & 0.727 & 0.590 \end{smallmatrix}$	-0.727	0.590	0.098	0° -66°
726	17 Tauri	3.8	+23 55	$\begin{smallmatrix} 8 & 18 & 53.3 \end{smallmatrix}$	$\begin{smallmatrix} - & 3 & 41.4 \\ - & 0.545 & 0.590 \end{smallmatrix}$	-0.545	0.590	+0.098	+11° -56°
727	η Tauri	4.4	24 16	$\begin{smallmatrix} 8 & 19 & 01.0 \end{smallmatrix}$	$\begin{smallmatrix} - & 3 & 34.1 \\ - & 0.894 & 0.590 \end{smallmatrix}$	-0.894	0.590	0.097	-11° -66°
728	20 Tauri	4.0	24 10	$\begin{smallmatrix} 8 & 19 & 15.7 \end{smallmatrix}$	$\begin{smallmatrix} - & 3 & 19.9 \\ - & 0.769 & 0.590 \end{smallmatrix}$	-0.769	0.590	0.097	-3° -66°
729	23 Tauri	4.2	23 45	$\begin{smallmatrix} 8 & 19 & 27.8 \end{smallmatrix}$	$\begin{smallmatrix} - & 3 & 08.3 \\ - & 0.323 & 0.590 \end{smallmatrix}$	-0.323	0.590	0.096	+23° -41°
730	γ Tauri	3.0	23 55	$\begin{smallmatrix} 8 & 19 & 55.2 \end{smallmatrix}$	$\begin{smallmatrix} - & 2 & 42.0 \\ - & 0.441 & 0.590 \end{smallmatrix}$	-0.441	0.590	0.095	+17° -48°
731	104 B. Tauri	5.5	+23 14	$\begin{smallmatrix} 8 & 20 & 16.0 \end{smallmatrix}$	$\begin{smallmatrix} - & 2 & 22.0 \\ - & 0.287 & 0.590 \end{smallmatrix}$	+0.287	0.590	+0.094	+59° -8°
732	27 Tauri	3.8	23 52	$\begin{smallmatrix} 8 & 20 & 35.0 \end{smallmatrix}$	$\begin{smallmatrix} - & 2 & 03.7 \\ - & 0.328 & 0.590 \end{smallmatrix}$	-0.328	0.590	+0.093	+23° -41°
733	120 B. Geminorum	6.5	21 22	$\begin{smallmatrix} 12 & 05 & 39.7 \end{smallmatrix}$	$\begin{smallmatrix} + & 3 & 53.3 \\ + & 1.035 & 0.564 \end{smallmatrix}$	+1.035	0.564	-0.117	+90° +33°
734	79 Geminorum	6.3	20 28	$\begin{smallmatrix} 12 & 21 & 11.0 \end{smallmatrix}$	$\begin{smallmatrix} - & 5 & 07.9 \\ - & 0.079 & 0.551 \end{smallmatrix}$	-0.079	0.551	0.147	+37° -34°
735	209 B. Geminorum	6.1	19 29	$\begin{smallmatrix} 13 & 00 & 17.2 \end{smallmatrix}$	$\begin{smallmatrix} - & 2 & 08.0 \\ - & 0.501 & 0.549 \end{smallmatrix}$	+0.501	0.549	0.153	+74° -4°
736	217 B. Geminorum	6.3	+20 00	$\begin{smallmatrix} 13 & 04 & 20.9 \end{smallmatrix}$	$\begin{smallmatrix} + & 1 & 47.5 \\ + & 0.670 & 0.546 \end{smallmatrix}$	-0.670	0.546	-0.160	+4° -69°
737	10 H. Cancrī	6.1	19 01	$\begin{smallmatrix} 13 & 06 & 11.6 \end{smallmatrix}$	$\begin{smallmatrix} + & 3 & 34.6 \\ + & 0.068 & 0.544 \end{smallmatrix}$	+0.068	0.544	-0.162	+45° -27°
738	ζ^1 Cancrī	5.1	17 50	$\begin{smallmatrix} 13 & 09 & 41.3 \end{smallmatrix}$	$\begin{smallmatrix} + & 6 & 57.4 \\ + & 0.756 & 0.541 \end{smallmatrix}$	+0.756	0.541	0.168	+90° +9°
739	δ^1 Cancrī	5.9	18 32	$\begin{smallmatrix} 13 & 14 & 57.9 \end{smallmatrix}$	$\begin{smallmatrix} -11 & 56.4 \\ - & 0.897 & 0.537 \end{smallmatrix}$	-0.897	0.537	0.176	-10° -72°
740	δ^2 Cancrī	6.2	17 15	$\begin{smallmatrix} 13 & 16 & 09.8 \end{smallmatrix}$	$\begin{smallmatrix} -10 & 46.8 \\ - & 0.267 & 0.536 \end{smallmatrix}$	-0.267	0.536	0.177	+57° -19°
741	54 Cancrī	6.3	+15 35	$\begin{smallmatrix} 14 & 04 & 26.7 \end{smallmatrix}$	$\begin{smallmatrix} + & 1 & 06.9 \\ + & 0.207 & 0.526 \end{smallmatrix}$	-0.207	0.526	-0.192	+30° -46°
742	α^1 Cancrī	5.2	15 34	$\begin{smallmatrix} 14 & 07 & 32.2 \end{smallmatrix}$	$\begin{smallmatrix} + & 4 & 06.6 \\ + & 0.786 & 0.524 \end{smallmatrix}$	-0.786	0.524	0.196	-2° -75°
743	α^2 Cancrī	5.6	15 50	$\begin{smallmatrix} 14 & 07 & 42.1 \end{smallmatrix}$	$\begin{smallmatrix} + & 4 & 16.3 \\ + & 1.099 & 0.524 \end{smallmatrix}$	-1.099	0.524	0.196	-23° -75°
744	α Leonis	3.8	10 11	$\begin{smallmatrix} 15 & 06 & 08.3 \end{smallmatrix}$	$\begin{smallmatrix} + & 2 & 02.4 \\ + & 0.401 & 0.510 \end{smallmatrix}$	+0.401	0.510	0.216	+65° -18°
745	89 B. Leonis	6.3	8 37	$\begin{smallmatrix} 15 & 15 & 10.3 \end{smallmatrix}$	$\begin{smallmatrix} +10 & 48.9 \\ + & 0.140 & 0.505 \end{smallmatrix}$	+0.140	0.505	0.221	+49° -32°
746	π Leonis	4.9	+8 21	$\begin{smallmatrix} 15 & 16 & 17.6 \end{smallmatrix}$	$\begin{smallmatrix} +11 & 54.4 \\ + & 0.185 & 0.505 \end{smallmatrix}$	+0.185	0.505	-0.222	+52° -30°
747	43 Leonis	6.3	6 52	$\begin{smallmatrix} 16 & 04 & 40.4 \end{smallmatrix}$	$\begin{smallmatrix} - & 0 & 03.6 \\ - & 0.968 & 0.500 \end{smallmatrix}$	-0.968	0.500	0.227	-12° -84°
748	ρ^3 Leonis	6.2	0 21	$\begin{smallmatrix} 17 & 03 & 11.7 \end{smallmatrix}$	$\begin{smallmatrix} - & 2 & 09.3 \\ - & 1.048 & 0.494 \end{smallmatrix}$	-1.048	0.494	0.232	+90° +17°
749	ρ^2 Leonis	5.4	+0 17	$\begin{smallmatrix} 17 & 08 & 52.2 \end{smallmatrix}$	$\begin{smallmatrix} + & 3 & 21.9 \\ + & 0.193 & 0.494 \end{smallmatrix}$	-0.193	0.494	0.232	+31° -52°
750	13 B. Virginis	5.8	-4 59	$\begin{smallmatrix} 18 & 05 & 43.3 \end{smallmatrix}$	$\begin{smallmatrix} - & 0 & 20.9 \\ - & 0.815 & 0.495 \end{smallmatrix}$	+0.815	0.495	0.228	+86° +2°
751	η Virginis	5.4	-9 06	$\begin{smallmatrix} 19 & 05 & 17.2 \end{smallmatrix}$	$\begin{smallmatrix} - & 1 & 25.8 \\ - & 0.093 & 0.501 \end{smallmatrix}$	+0.093	0.501	-0.218	+44° -36°
752	75 Virginis	5.6	15 02	$\begin{smallmatrix} 20 & 12 & 30.2 \end{smallmatrix}$	$\begin{smallmatrix} + & 4 & 53.4 \\ + & 0.170 & 0.517 \end{smallmatrix}$	+0.170	0.517	0.193	+44° -32°
753	85 Virginis	6.2	15 27	$\begin{smallmatrix} 20 & 18 & 57.8 \end{smallmatrix}$	$\begin{smallmatrix} +11 & 09.4 \\ + & 0.601 & 0.521 \end{smallmatrix}$	-0.601	0.521	0.186	+3° -82°
754	43 H. Virginis	5.6	17 54	$\begin{smallmatrix} 21 & 09 & 42.0 \end{smallmatrix}$	$\begin{smallmatrix} + & 1 & 26.2 \\ + & 0.518 & 0.531 \end{smallmatrix}$	-0.518	0.531	0.167	+5° -75°
755	17 G. Libræ	6.4	20 54	$\begin{smallmatrix} 22 & 00 & 19.5 \end{smallmatrix}$	$\begin{smallmatrix} - & 8 & 24.5 \\ - & 0.464 & 0.542 \end{smallmatrix}$	+0.464	0.542	0.144	+56° -16°
756	18 G. Libræ	6.1	-21 03	$\begin{smallmatrix} 22 & 00 & 48.5 \end{smallmatrix}$	$\begin{smallmatrix} - & 7 & 56.4 \\ - & 0.559 & 0.542 \end{smallmatrix}$	+0.559	0.542	-0.143	+61° -10°
757	42 Libræ	5.1	23 37	$\begin{smallmatrix} 23 & 00 & 44.4 \end{smallmatrix}$	$\begin{smallmatrix} - & 8 & 49.5 \\ - & 0.409 & 0.560 \end{smallmatrix}$	+0.409	0.560	0.097	+47° -18°
758	31 B. Scorpii	5.4	24 21	$\begin{smallmatrix} 23 & 06 & 39.4 \end{smallmatrix}$	$\begin{smallmatrix} - & 3 & 07.2 \\ - & 0.655 & 0.564 \end{smallmatrix}$	+0.655	0.564	0.084	+62° -4°
759	50 B. Scorpii	6.4	24 33	$\begin{smallmatrix} 23 & 10 & 57.7 \end{smallmatrix}$	$\begin{smallmatrix} + & 1 & 01.9 \\ + & 0.534 & 0.567 \end{smallmatrix}$	-0.534	0.567	-0.074	+53° -11°
760	ρ Capricorni	5.0	18 02	$\begin{smallmatrix} 28 & 00 & 23.1 \end{smallmatrix}$	$\begin{smallmatrix} +10 & 20.1 \\ + & 0.790 & 0.567 \end{smallmatrix}$	+0.790	0.567	+0.190	+72° +3°
761	95 B. Capricorni	6.0	-14 44	$\begin{smallmatrix} 28 & 13 & 22.0 \end{smallmatrix}$	$\begin{smallmatrix} - & 1 & 08.9 \\ - & 0.045 & 0.560 \end{smallmatrix}$	+0.045	0.560	+0.211	+38° -39°
762	72 B. Aquarii	6.5	11 51	$\begin{smallmatrix} 29 & 02 & 28.2 \end{smallmatrix}$	$\begin{smallmatrix} +11 & 29.9 \\ + & 0.006 & 0.554 \end{smallmatrix}$	-0.006	0.554	0.228	+37° -42°
763	137 B. Capricorni	6.2	10 52	$\begin{smallmatrix} 29 & 07 & 31.5 \end{smallmatrix}$	$\begin{smallmatrix} - & 7 & 37.2 \\ - & 0.165 & 0.552 \end{smallmatrix}$	+0.165	0.552	0.233	+47° -33°
764	α^1 Capricorni	5.3	9 23	$\begin{smallmatrix} 29 & 10 & 02.1 \end{smallmatrix}$	$\begin{smallmatrix} - & 5 & 11.7 \\ - & 0.755 & 0.551 \end{smallmatrix}$	-0.755	0.551	0.235	-1° -90°
765	α^2 Capricorni	6.2	9 34	$\begin{smallmatrix} 29 & 10 & 36.4 \end{smallmatrix}$	$\begin{smallmatrix} - & 4 & 38.6 \\ - & 0.422 & 0.551 \end{smallmatrix}$	-0.422	0.551	0.236	+17° -67°
766	κ Aquarii	5.3	-4 34	$\begin{smallmatrix} 30 & 10 & 14.8 \end{smallmatrix}$	$\begin{smallmatrix} - & 5 & 47.9 \\ - & 0.288 & 0.544 \end{smallmatrix}$	+0.288	0.544	+0.251	+57° -26°
767	6 G. Piscium	6.2	-2 44	$\begin{smallmatrix} 30 & 19 & 46.8 \end{smallmatrix}$	$\begin{smallmatrix} + & 3 & 25.1 \\ + & 0.856 & 0.542 \end{smallmatrix}$	-0.856	0.542	0.254	+88° +4°
768	κ Piscium	4.9	+0 54	$\begin{smallmatrix} 31 & 09 & 09.4 \end{smallmatrix}$	$\begin{smallmatrix} - & 7 & 38.7 \\ - & 0.568 & 0.542 \end{smallmatrix}$	-0.568	0.542	0.254	+77° -12°
769	19 Piscium	5.3	+3 08	$\begin{smallmatrix} 31 & 18 & 14.0 \end{smallmatrix}$	$\begin{smallmatrix} + & 1 & 07.8 \\ + & 0.608 & 0.542 \end{smallmatrix}$	+0.608	0.542	+0.251	+81° -9°

Full Moon—Dec. 10^d 03^h
 New Moon—Dec. 25^d 18^h

Last Quarter—Dec. 17^d 22^h
 First Quarter—Dec. 32^d 15^h

LUNAR OCCULTATIONS, 1935

OCCULTATIONS VISIBLE AT GREENWICH

Date	Star	Mag.	Phase	G.M.T.	<i>a</i>	<i>b</i>	<i>P</i>
Jan. 2	π Scorpii	3.0	R	^h 7 ^m 39.5	^m -1.4	^m +0.8	^o 265
8	186 B. Aquarii	6.2	D	18 01.5	-0.7	0.0	46
12	47 B. Arietis	6.5	D	23 22	-0.5	-1.3	82
14	17 Tauri	3.8	D	16 50	-0.6	+1.9	64
14	16 Tauri	5.4	D	17 09	+0.1	+3.4	19
14	20 Tauri	4.0	D	17 43	-0.1	+3.6	19
14	23 Tauri	4.2	D	17 45	—	—	134
14	η Tauri	3.0	D	18 16.5	-1.7	+0.2	110
14	η Tauri	3.0	R	19 17.5	-1.0	+2.6	214
14	28 Tauri	5.2	D	19 30	—	—	141
16	125 Tauri	5.0	D	18 48.5	-1.6	-0.6	135
24	388 B. Leonis	6.3	R	5 01	-0.7	-2.0	333
27	W.Z.C. 871	7.0	R	2 14.5	+0.6	-2.1	2
Feb. 11	17 Tauri	3.8	D	0 42	-0.1	-0.8	62
11	23 Tauri	4.2	D	1 15.5	+0.4	-1.6	104
13	125 Tauri	5.0	D	2 21.5	-0.1	-1.2	75
14	52 B. Geminorum	6.4	D	4 03.5	+0.2	-1.2	74
20	ρ^s Leonis	5.4	R	3 31	-1.2	-1.6	294
26	65 B. Scorpii	5.6	R	5 13	-1.6	+0.2	272
Mar. 12	W.Z.C. 414	7.0	D	18 33.5	-1.5	-2.1	135
15	217 B. Geminorum	6.3	D	1 57.5	+0.4	-2.2	152
Apr. 6	η Tauri	3.0	D	18 50	-1.5	+1.7	22
6	η Tauri	3.0	R	19 19.5	—	—	328
6	27 Tauri	3.8	D	19 24.5	-0.8	-0.3	50
6	28 Tauri	5.2	D	19 37	-1.3	+1.5	22
6	B.D. +23°569	6.7	D	19 39	-0.3	-1.7	100
6	B.D. +23°563	6.1	D	19 41	+0.1	-2.9	133
8	B.D. +25°978	6.6	D	20 12.5	-1.0	-1.0	75
8	W.Z.C. 401	7.7	D	23 03	+0.4	-2.0	131
10	87 B. Geminorum	5.8	D	0 34.5	+0.2	-1.3	83
15	388 B. Leonis	6.3	D	23 19.5	-1.9	-0.8	86
21	153 B. Libræ	6.3	R	1 52	-1.4	-0.4	298
22	α Scorpii (<i>Antares</i>)	1.2	R	1 05.5	-1.4	+0.6	274
22	116 B. Scorpii	6.2	R	2 12.5	-1.6	+0.2	267
May 7	8 Geminorum	3.5	D	21 59.5	0.0	-1.7	107
7	8 Geminorum	3.5	R	22 56	+0.3	-1.6	290
26	W.Z.C. 1530	6.6	R	2 54.5	-0.9	+1.3	286
June 21	λ Capricorni	5.4	R	0 11.5	-0.8	+1.4	272
22	W.Z.C. 1515	7.0	R	1 33	-0.8	+1.6	240
July 18	ρ Aquarii	5.4	R	22 37.5	-0.6	+1.9	216
19	170 B. Aquarii	6.1	R	0 41.5	-1.1	+1.2	247
24	B.D. +19°432	7.0	R	1 19.5	—	—	168
25	104 B. Tauri	5.5	R	0 51	+0.4	+1.6	246
25	B.D. +23°563	6.1	R	1 25	-0.1	+1.1	292
Aug. 8	Δ Scorpii	4.7	D	20 24	-1.4	-0.8	83

LUNAR OCCULTATIONS, 1935

557

OCCULTATIONS VISIBLE AT GREENWICH

Date	Star	Mag.	Phase	G.M.T.	a	b	P
Aug. 18	101 Piscium	6.2	R	^h 22 ⁿ 24.5	^m -0.2	^m +1.6	^o 264
20	μ Arietis	5.7	R	3 18.5	-0.5	+2.8	203
21	W.Z.C. 207	6.7	R	2 02	-0.9	+1.2	279
23	118 Tauri	5.4	R	0 48.5	+0.1	+1.3	276
Sept. 7	λ Sagittarii	2.9	D	19 29.5	-1.3	+0.4	48
7	C.D. -25°13170	6.2	D	20 31.5	-0.5	+0.7	19
7	λ Sagittarii	2.9	R	20 35	-1.7	-0.9	289
9	12 Capricorni	6.1	D	20 43.5	-1.2	+0.7	50
15	20 H ¹ . Arietis	6.4	R	21 26.5	0.0	+1.9	226
20	5 Geminorum	5.9	R	1 07	-0.3	+1.5	272
21	44 Geminorum	5.9	R	0 45.5	-0.2	+0.7	307
23	54 Cancri	6.3	R	4 03.5	-0.5	+1.4	278
24	B.D. +11°2071	7.6	R	5 12.5	-0.7	+0.6	300
Oct. 14	104 B. Tauri	5.5	R	23 43	-1.7	-0.2	305
16	κ Tauri	5.6	R	4 12.5	-1.4	-1.7	300
16	132 Tauri	5.0	R	23 38.5	-0.4	+1.6	264
19	79 Geminorum	6.3	R	2 33	-1.1	-0.1	311
Nov. 2	W.Z.C. 1315	6.7	D	18 43.5	-0.7	+0.1	39
6	22 B. Piscium	6.5	D	18 37.5	-1.0	+1.5	50
6	9 Piscium	6.4	D	21 26	-0.2	+2.1	6
13	8 Geminorum	6.1	R	20 08.5	—	—	339
13	9 Geminorum	6.3	R	20 42.5	0.0	+1.4	274
21	W.Z.C. 783	7.1	R	6 08.5	-0.7	-0.7	328
30	π Capricorni	5.2	D	16 57	-1.8	-0.9	101
30	ρ Capricorni	5.0	D	17 57.5	-0.9	-0.3	58
30	W.Z.C. 1361	6.7	D	17 58.5	-1.1	-0.6	73
Dec. 1	18 Aquarii	5.5	D	18 40.5	-1.3	-0.8	82
2	W.Z.C. 1494	7.5	D	21 56	-0.1	+0.8	20
8	47 Arietis	5.8	D	0 47.5	—	—	159
13	209 B. Geminorum	6.1	R	0 08.5	-1.3	+0.8	278
18	13 B. Virginis	5.8	R	6 15.5	-1.4	-0.8	300
31	19 Piscium	5.3	D	18 08	-1.1	+0.5	54

OCCULTATIONS VISIBLE AT EDINBURGH

Date	Star	Mag.	Phase	G.M.T.	<i>a</i>	<i>b</i>	<i>P</i>
Jan. 8	186 B. Aquarii	6.2	D	^h 18 ^m 01	^m -0.4	^m +0.4	[°] 30
12	47 B. Arietis	6.5	D	23 15.5	-0.6	-1.0	69
14	17 Tauri	3.8	D	16 58	-0.4	+2.2	51
14	23 Tauri	4.2	D	17 30.5	-1.3	+0.6	113
14	7 Tauri	3.0	D	18 14.5	-1.2	+1.0	94
14	28 Tauri	5.2	D	19 16.5	-1.7	-0.4	115
14	7 Tauri	3.0	R	19 24	-1.0	+1.8	232
14	27 Tauri	3.8	D	19 31	—	—	149
16	125 Tauri	5.0	D	18 45.5	-1.0	+0.7	116
24	388 B. Leonis	6.3	R	4 50.5	-0.6	-1.7	335
Feb. 11	17 Tauri	3.8	D	0 37.5	-0.3	-0.8	54
11	23 Tauri	4.2	D	1 09.5	+0.2	-1.6	98
11	W.Z.C. 224	6.8	D	1 37	+0.1	-0.8	64
11	7 Tauri	3.0	D	1 40	+0.1	-1.1	67
13	125 Tauri	5.0	D	2 15	-0.2	-1.3	71
14	52 B. Geminorum	6.4	D	3 58	+0.1	-1.3	71
20	<i>p</i> ⁸ Leonis	5.4	R	3 20.5	-1.1	-1.4	295
Mar. 12	W.Z.C. 414	7.0	D	18 22.5	-1.4	-0.8	118
15	217 B. Geminorum	6.3	D	1 48.5	+0.2	-2.3	149
Apr. 6	27 Tauri	3.8	D	19 21.5	-0.9	+0.2	37
6	B.D. +23°563	6.1	D	19 28.5	-0.2	-2.4	121
6	B.D. +23°569	6.7	D	19 31	-0.4	-1.5	90
8	B.D. +25°978	6.6	D	20 05	-1.1	-0.7	67
8	W.Z.C. 401	7.7	D	22 55.5	+0.3	-2.0	127
10	87 B. Geminorum	5.8	D	0 29	+0.1	-1.4	81
15	388 B. Leonis	6.3	D	23 10.5	-1.7	-0.6	83
21	153 B. Libræ	6.3	R	1 46.5	-1.2	-0.2	300
May 5	118 Tauri	5.4	D	21 47.5	+0.3	-1.5	100
7	8 Geminorum	3.5	D	21 52	-0.1	-1.8	105
7	8 Geminorum	3.5	R	22 49.5	+0.2	-1.7	291
26	W.Z.C. 1530	6.6	R	2 57.5	-0.8	+1.4	293
June 22	W.Z.C. 1515	7.0	R	1 38	-0.7	+1.6	245
July 19	170 B. Aquarii	6.1	R	0 43.5	-1.0	+1.2	253
24	B.D. +19°432	7.0	R	1 37.5	+0.6	+2.6	190
25	104 B. Tauri	5.5	R	0 58.5	+0.3	+1.5	252
25	B.D. +23°563	6.1	R	1 29.5	-0.2	+1.1	302
Aug. 18	101 Piscium	6.2	R	22 31	-0.2	+1.6	270
20	<i>μ</i> Arietis	5.7	R	3 27	-0.7	+2.1	220
21	W.Z.C. 207	6.7	R	2 04	-0.9	+1.0	292
22	B.D. +24°674	6.3	R	4 06.5	-1.8	-1.1	311
23	118 Tauri	5.4	R	0 54.5	+0.1	+1.2	286
Sept. 9	12 Capricorni	6.1	D	20 43.5	-1.0	+0.7	43
15	20 H ¹ Arietis	6.4	R	21 34.5	0.0	+1.8	233
20	5 Geminorum	5.9	R	1 12	-0.3	+1.3	285
21	44 Geminorum	5.9	R	0 46.5	-0.3	+0.3	323

LUNAR OCCULTATIONS, 1935

559

OCCULTATIONS VISIBLE AT EDINBURGH

Date	Star	Mag.	Phase	G.M.T.	α	b	P
Sept. 22	10 H. Cancrī	6.1	R	^h 4 ^m 59.5	—	—	216°
23	54 Cancrī	6.3	R	4 07	-0.4	+1.0	293
24	B.D. +11°2071	7.6	R	5 12.5	-0.5	+0.3	315
Oct. 16	315 B. Tauri	6.3	R	2 52.5	-1.0	+3.6	208
16	κ Tauri	5.6	R	3 59	-1.3	-2.6	318
16	132 Tauri	5.0	R	23 43.5	-0.4	+1.4	276
19	79 Geminorum	6.3	R	2 27.5	-1.0	-0.8	330
Nov. 2	W.Z.C. 1315	6.7	D	18 42	-0.5	+0.2	28
6	22 B. Piscium	6.5	D	18 41	-0.7	+1.5	42
13	9 Geminorum	6.3	R	20 48	-0.1	+1.2	285
20	B.D. -1°2521	6.7	R	7 22	-1.6	0.0	278
21	W.Z.C. 783	7.1	R	6 03.5	-0.4	-0.8	336
23	W.Z.C. 871	7.0	R	7 30	-0.9	+0.7	293
30	π Capricorni	5.2	D	16 49.5	-1.4	-0.4	90
30	W.Z.C. 1361	6.7	D	17 53	-0.9	-0.4	62
30	ρ Capricorni	5.0	D	17 54	-0.6	-0.2	46
Dec. 1	18 Aquarii	5.5	D	18 34.5	-1.0	-0.4	69
8	47 Arietis	5.8	D	0 22.5	-1.0	-2.7	125
12	120 B. Geminorum	6.5	R	7 01	-0.7	-1.0	234
13	209 B. Geminorum	6.1	R	0 07.5	-1.1	+0.5	292
18	13 B. Virginis	5.8	R	6 08.5	-1.2	-0.6	304
30	6 G. Piscium	6.2	D	20 09.5	-1.0	-2.8	114
31	19 Piscium	5.3	D	18 08	-0.8	+0.8	40

OCCULTATIONS VISIBLE AT CAPE OF GOOD HOPE

Date	Star	Mag.	Phase	G.M.T.	<i>a</i>	<i>b</i>	<i>P</i>
				^h ^m	^m	^m	[°]
Jan. 10	36 Piscium	6.2	D	20 20	—	—	344
14	14 H. Tauri	5.4	D	20 38.5	-2.2	+0.3	104
24	359 B. Leonis	6.3	R	2 03	-1.7	-1.6	314
26	W.Z.C. 825	6.6	R	1 41.5	-0.8	-2.8	336
30	σ Scorpii	3.1	D	1 01	—	—	178
30	σ Scorpii	3.1	R	1 19.5	—	—	215
31	136 G. Ophiuchi	6.3	R	2 33	—	—	356
Feb. 1	C.D. -25°13'170	6.2	R	2 15	-0.3	-0.1	236
24	43 B. Libræ	5.8	R	21 13.5	+0.2	-1.2	277
25	47 G. Libræ	6.1	R	1 38	—	—	356
25	40 B. Scorpii	5.4	R	23 45.5	—	—	208
26	50 B. Scorpii	6.4	R	2 24.5	—	—	0
26	W.Z.C. 1087	7.1	R	22 47	+0.1	-0.9	266
Mar. 8	W.Z.C. 134	7.1	D	17 49	-1.0	+0.8	102
12	B.D. +26°1082	7.0	D	21 04.5	-1.8	+2.1	64
24	169 B. Libræ	5.8	R	20 15	+1.3	-3.3	353
24	42 Libræ	5.1	R	21 46.5	-1.6	+0.2	236
Apr. 10	B.D. +23°1744	6.4	D	19 10.5	-1.4	-0.1	120
12	81 Cancrī	6.4	D	21 12	-1.5	+0.3	108
14	35 Sextantis	6.0	D	23 15.5	-1.3	+0.6	104
15	359 B. Leonis	6.3	D	20 07.5	-2.4	-1.0	109
23	136 G. Ophiuchi	6.3	R	0 04.5	-2.1	0.0	254
23	70 B. Sagittarii	6.4	R	21 16.5	-0.4	-0.5	248
26	π Capricorni	5.2	R	1 32	-1.3	-0.7	261
26	W.Z.C. 1361	6.7	R	2 22	—	—	311
27	18 Aquarii	5.5	R	2 21	-1.3	-1.7	282
May 12	ρ ⁴ Leonis	5.7	D	19 26.5	—	—	75
21	191 B. Sagittarii	6.5	R	22 20	-1.5	+0.4	234
22	222 B. Sagittarii	5.6	R	5 16	-0.4	+2.5	218
27	19 Piscium	5.3	R	1 07.5	+0.1	+2.6	185
June 5	θ Cancrī	5.6	D	16 40	-0.6	-1.1	149
9	431 B. Leonis	6.2	D	22 32	-0.3	+1.4	88
13	17 G. Libræ	6.4	D	21 21.5	—	—	165
14	42 Libræ	5.1	D	19 27.5	-1.6	-2.0	125
15	32 B. Scorpii	5.4	D	3 04	+0.2	+1.6	67
20	95 B. Capricorni	6.0	R	5 17.5	-1.5	+0.7	281
21	κ Aquarii	5.3	R	23 04	-0.9	-1.6	280
26	θ Arietis	5.7	R	5 22.5	-2.2	-0.5	266
26	W.Z.C. 137	6.9	R	5 31	-0.4	+1.9	196
July 9	75 Virginis	5.6	D	19 37.5	-1.5	-1.8	145
10	236 G. Virginis	5.7	D	16 14.5	-3.1	+0.3	72
17	18 Aquarii	5.5	R	21 53.5	—	—	170
23	ι Arietis	5.2	R	0 48.5	-0.4	+0.4	225
Aug. 4	W.Z.C. 805	6.7	D	17 15	—	—	201
7	43 B. Libræ	5.8	D	20 39	—	—	28

LUNAR OCCULTATIONS, 1935

561

OCCULTATIONS VISIBLE AT CAPE OF GOOD HOPE

Date	Star	Mag.	Phase	G.M.T.	<i>a</i>	<i>b</i>	<i>P</i>
Aug. 11	154 B. Sagittarii	5.9	D	^h ^m 22 09.5	^m —	^m —	[°] 354
12	168 B. Sagittarii	6.3	D	0 53	+0.9	+3.6	9
19	105 Piscium	6.1	R	0 18	-1.3	0.0	243
19	3 Arietis	6.5	R	4 58.5	-1.8	+1.3	249
Sept. 5	22 Scorpii	4.9	D	20 23	-1.2	+0.4	111
7	W.Z.C. 1214	6.7	D	22 19	-0.9	+1.0	94
7	24 Sagittarii	5.7	D	23 06	-0.7	+0.7	104
8	50 Sagittarii	5.6	D	18 53.5	-1.8	+1.9	49
8	253 B. Sagittarii	6.0	D	21 41.5	-0.9	+2.1	49
10	47 B. Capricorni	6.2	D	0 27.5	-0.4	+1.6	65
16	θ Arietis	5.7	R	2 43	-2.3	+0.5	273
Oct. 1	64 G. Libræ	5.7	D	17 47	-1.2	-0.5	131
2	W.Z.C. 1035	6.6	D	17 47.5	-2.3	-2.3	147
2	41 G. Scorpii	6.3	D	19 24.5	-0.6	+0.6	108
2	W.Z.C. 1047	6.6	D	20 35.5	+0.2	+1.2	82
3	W.Z.C. 1104	7.2	D	18 33.5	0.0	+3.9	29
3	137 B. Ophiuchi	6.3	D	20 32	-1.0	-0.4	132
5	W.Z.C. 1260	6.7	D	18 06.5	-2.9	-0.9	115
5	199 B. Sagittarii	6.4	D	23 00	—	—	357
6	W.Z.C. 1335	7.0	D	21 50	-2.2	-0.6	126
7	95 B. Capricorni	6.0	D	18 19	-1.0	+3.0	19
14	17 Tauri	3.8	D	20 56.5	-1.1	-1.5	103
14	9 Tauri	4.4	D	21 20.5	-0.1	+0.7	34
14	20 Tauri	4.0	D	21 26.5	-0.7	-0.3	66
14	17 Tauri	3.8	R	21 52	-0.4	+0.7	216
14	16 Tauri	5.4	R	22 03.5	-1.2	-0.4	254
14	9 Tauri	4.4	R	22 17	-1.9	-1.4	285
14	20 Tauri	4.0	R	22 37	-1.4	-0.3	253
14	21 Tauri	5.8	R	22 38.5	-2.3	-1.6	292
14	22 Tauri	6.5	R	22 45	-2.1	-1.2	283
Nov. 1	ν ¹ Sagittarii	5.0	D	20 40	-0.7	+0.1	124
1	ν ² Sagittarii	5.0	D	21 03.5	-0.4	+0.1	124
2	f Sagittarii	5.1	D	18 36	-0.4	+2.7	32
2	57 Sagittarii	6.0	D	21 45.5	+0.8	+2.8	11
12	χ Tauri	5.4	R	0 34.5	-2.2	-0.1	286
Dec. 2	44 Aquarii	5.8	D	20 10	-0.3	+2.4	24
6	4 Arietis	5.7	D	18 18	-3.1	-1.6	110
8	20 Tauri	4.0	D	17 49	-0.3	+0.4	42
8	9 Tauri	4.4	D	17 59.5	—	—	352
8	7 Tauri	3.0	D	18 43	—	—	140
8	7 Tauri	3.0	R	19 09	—	—	181

LUNAR OCCULTATIONS, 1935

OCCULTATIONS VISIBLE AT JOHANNESBURG

Date	Star	Mag.	Phase	G.M.T.	<i>a</i>	<i>b</i>	<i>P</i>
Jan. 14	14 H. Tauri	5.4	D	^h 21 ^m 03	^m -2.0	^m +1.0	^a 84
24	359 B. Leonis	6.3	R	1 55	-0.1	-3.6	358
30	σ Scorpii	3.1	D	0 34.5	+0.2	-1.8	130
30	σ Scorpii	3.1	R	1 40	-0.9	-0.8	266
Feb. 1	C.D. -25°13'170	6.2	R	2 13	-0.1	-0.9	273
24	43 B. Libræ	5.8	R	21 01.5	+0.2	-1.5	303
25	31 B. Scorpii	5.4	R	21 46.5	-0.5	-0.1	243
26	40 B. Scorpii	5.4	R	0 06	-1.4	-0.8	268
26	W.Z.C. 1087	7.1	R	22 36	+0.3	-1.4	298
Mar. 13	37 Geminorum	5.8	D	17 25.5	—	—	48
24	42 Libræ	5.1	R	21 54	-1.0	-1.1	278
Apr. 8	B.D. +26°884	6.5	D	16 32	-1.4	-1.1	136
10	B.D. +23°1744	6.4	D	19 31	-2.0	+1.4	80
12	81 Cancri	6.4	D	21 47.5	—	—	45
14	35 Sextantis	6.0	D	23 50	—	—	41
23	136 G. Ophiuchi	6.3	R	0 20.5	-2.3	-1.4	290
23	151 G. Ophiuchi	6.0	R	2 47	—	—	181
23	70 B. Sagittarii	6.4	R	21 13	-0.2	-1.3	284
26	π Capricorni	5.2	R	1 37.5	-2.0	-2.2	292
May 10	W.Z.C. 646	6.7	D	15 48.5	-3.2	-0.6	96
11	43 Leonis	6.3	D	20 16.5	+0.1	-3.2	176
21	191 B. Sagittarii	6.5	R	22 34.5	-1.8	-0.7	269
27	19 Piscium	5.3	R	1 21.5	-0.4	+1.2	213
June 5	θ Cancri	5.6	D	16 46	-1.3	+0.1	109
6	B.D. +13°2074	6.6	D	18 59.5	+0.1	-1.5	155
13	17 G. Libræ	6.4	D	21 22.5	-2.2	-1.1	124
13	18 G. Libræ	6.1	D	22 15	-2.0	-2.0	144
14	42 Libræ	5.1	D	19 40	-2.9	0.0	86
July 9	75 Virginis	5.6	D	19 47	-1.6	-0.1	112
17	18 Aquarii	5.5	R	22 31.5	-1.1	+2.9	199
23	ι Arietis	5.2	R	0 56.5	-0.8	+0.4	233
Aug. 4	W.Z.C. 805	6.7	D	16 55.5	-1.3	-1.5	142
8	31 B. Scorpii	5.4	D	21 52.5	—	—	155
12	168 B. Sagittarii	6.3	D	1 11	—	—	357
19	105 Piscium	6.1	R	0 34.5	-1.9	+0.4	245
25	58 Geminorum	6.0	R	2 53	-0.8	-0.7	263
Sept. 3	9 G. Libræ	6.5	D	16 45.5	—	—	173
5	22 Scorpii	4.9	D	20 36	-0.6	+0.6	100
7	70 B. Sagittarii	6.4	D	16 21	-2.6	-1.2	105
7	W.Z.C. 1214	6.7	D	22 33	-0.4	+0.9	89
7	24 Sagittarii	5.7	D	23 15.5	-0.2	+0.6	98
8	50 Sagittarii	5.6	D	19 27.5	-1.3	+2.8	35
8	253 B. Sagittarii	6.0	D	22 04	-0.4	+2.0	45
10	47 B. Capricorni	6.2	D	0 41.5	-0.1	+1.4	61
10	18 Aquarii	5.5	D	19 10	—	—	135

LUNAR OCCULTATIONS, 1935

563

OCCULTATIONS VISIBLE AT JOHANNESBURG

Date	Star	Mag.	Phase	G.M.T.	<i>a</i>	<i>b</i>	<i>P</i>
Sept. 16	θ Arietis	5.7	R	^h 3 ^m 07.5	^m -2.1	^m +0.2	^o 285
Oct. 1	64 G. Libræ	5.7	D	17 55	-0.7	+0.1	113
2	24 G. Scorpii	6.2	D	16 30	-1.8	+0.6	95
2	W.Z.C. 1035	6.6	D	17 55	-1.4	-0.6	126
2	41 G. Scorpii	6.3	D	19 32.5	-0.1	+0.6	97
3	W.Z.C. 1104	7.2	D	19 02	—	—	9
3	137 B. Ophiuchi	6.3	D	20 37	-0.4	-0.2	122
5	168 B. Sagittarii	6.3	D	17 41.5	—	—	349
5	W.Z.C. 1260	6.7	D	18 29.5	-2.4	0.0	104
6	W.Z.C. 1335	7.0	D	22 03.5	-1.3	-0.3	121
7	95 B. Capricorni	6.0	D	18 52	-0.4	+3.6	11
14	17 Tauri	3.8	D	20 59.5	-1.5	-1.0	96
14	<i>g</i> Tauri	4.4	D	21 30	-0.3	+1.4	28
14	20 Tauri	4.0	D	21 34.5	-1.1	+0.2	62
14	17 Tauri	3.8	R	22 04.5	-1.0	+1.0	221
14	16 Tauri	5.4	R	22 15.5	-1.8	-0.2	258
14	<i>g</i> Tauri	4.4	R	22 28	-2.7	-1.3	289
14	21 Tauri	5.8	R	22 51.5	-3.1	-1.7	297
14	20 Tauri	4.0	R	22 52	-2.1	0.0	256
14	22 Tauri	6.5	R	22 59.5	-2.8	-1.1	287
20	θ Cancræ	5.6	R	0 21.5	-1.2	-2.2	312
Nov. 2	<i>f</i> Sagittarii	5.1	D	18 58.5	0.0	+2.5	29
3	61 B. Capricorni	5.9	D	17 47	-2.6	+0.3	96
7	<i>d</i> Piscium	5.6	D	21 40	—	—	135
12	χ Tauri	5.4	R	0 52	-1.9	-0.8	308
Dec. 2	44 Aquarii	5.8	D	20 31	0.0	+2.7	16
6	4 Arietis	5.7	D	18 40	-3.6	-1.1	109
8	17 Tauri	3.8	D	17 15	-1.0	-0.3	73
8	16 Tauri	5.4	D	17 27	-0.3	+1.1	34
8	20 Tauri	4.0	D	17 59	-0.6	+1.0	37
8	η Tauri	3.0	D	18 50	—	—	130
8	η Tauri	3.0	R	19 31.5	—	—	191

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN

Date	P	B ₀	L ₀	Date	P	B ₀	L ₀
Jan. 1	+ 2.43	-3.03	160.50	Feb. 16	-17.56	-6.87	274.80
2	1.94	3.15	147.33	17	17.89	6.91	261.63
3	1.46	3.27	134.16	18	18.22	6.95	248.46
4	0.97	3.38	120.99	19	18.54	6.99	235.29
5	+ 0.48	3.49	107.82	20	18.85	7.02	222.12
6	0.00	-3.60	94.65	21	-19.16	-7.05	208.95
7	- 0.49	3.72	81.48	22	19.47	7.08	195.78
8	0.98	3.83	68.31	23	19.77	7.11	182.61
9	1.46	3.94	55.14	24	20.06	7.13	169.44
10	1.94	4.04	41.98	25	20.34	7.15	156.27
11	- 2.42	-4.15	28.81	26	-20.62	-7.17	143.10
12	2.90	4.25	15.64	27	20.90	7.19	129.92
13	3.38	4.36	2.47	28	21.16	7.20	116.75
14	3.86	4.46	349.30	Mar. 1	21.42	7.22	103.58
15	4.33	4.56	336.14	2	21.68	7.23	90.41
16	- 4.80	-4.66	322.97	3	-21.93	-7.24	77.24
17	5.27	4.76	309.80	4	22.17	7.24	64.06
18	5.74	4.86	296.64	5	22.41	7.25	50.89
19	6.20	4.95	283.47	6	22.64	7.25	37.71
20	6.66	5.04	270.30	7	22.86	7.25	24.54
21	- 7.12	-5.14	257.13	8	-23.08	-7.25	11.36
22	7.57	5.22	243.97	9	23.29	7.24	358.19
23	8.02	5.31	230.80	10	23.49	7.24	345.01
24	8.47	5.40	217.63	11	23.69	7.23	331.83
25	8.92	5.49	204.47	12	23.88	7.22	318.65
26	- 9.36	-5.57	191.30	13	-24.06	-7.20	305.48
27	9.79	5.65	178.13	14	24.24	7.18	292.30
28	10.22	5.73	164.97	15	24.41	7.17	279.12
29	10.65	5.81	151.80	16	24.57	7.15	265.94
30	11.08	5.88	138.63	17	24.73	7.12	252.75
31	-11.50	-5.96	125.47	18	-24.88	-7.10	239.57
Feb. 1	11.91	6.03	112.30	19	25.02	7.07	226.39
2	12.32	6.10	99.14	20	25.16	7.05	213.21
3	12.73	6.17	85.97	21	25.29	7.02	200.02
4	13.13	6.24	72.80	22	25.41	6.98	186.84
5	-13.53	-6.30	59.64	23	-25.52	-6.95	173.65
6	13.92	6.36	46.47	24	25.63	6.91	160.46
7	14.31	6.42	33.30	25	25.73	6.87	147.28
8	14.69	6.48	20.14	26	25.83	6.83	134.09
9	15.07	6.54	6.97	27	25.91	6.79	120.90
10	-15.44	-6.59	353.80	28	-25.99	-6.74	107.71
11	15.81	6.64	340.64	29	26.07	6.70	94.52
12	16.17	6.70	327.47	30	26.13	6.65	81.33
13	16.52	6.74	314.30	31	26.19	6.60	68.14
14	16.87	6.79	301.13	Apr. 1	26.24	6.54	54.95
15	-17.22	-6.83	287.97	2	-26.29	-6.49	41.76
16	-17.56	-6.87	274.80	3	-26.32	-6.43	28.56

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN

Date	P	B ₀	L ₀	Date	P	B ₀	L ₀
Apr. 1	-26.24	-6.54	54.95	May 17	-20.74	-2.44	167.26
2	26.29	6.49	41.76	18	20.46	2.32	154.03
3	26.32	6.43	28.56	19	20.17	2.21	140.81
4	26.35	6.37	15.37	20	19.87	2.09	127.58
5	26.38	6.31	2.17	21	19.56	1.97	114.35
6	-26.39	-6.25	348.98	22	-19.25	-1.86	101.12
7	26.40	6.18	335.78	23	18.94	1.74	87.89
8	26.40	6.12	322.58	24	18.61	1.62	74.66
9	26.40	6.05	309.39	25	18.28	1.50	61.43
10	26.38	5.98	296.19	26	17.95	1.38	48.20
11	-26.36	-5.91	282.99	27	-17.61	-1.26	34.97
12	26.33	5.84	269.78	28	17.26	1.14	21.73
13	26.30	5.76	256.58	29	16.91	1.03	8.50
14	26.25	5.69	243.38	30	16.55	0.91	355.27
15	26.20	5.61	230.18	31	16.19	0.79	342.04
16	-26.14	-5.53	216.97	June 1	-15.82	-0.66	328.80
17	26.08	5.45	203.77	2	15.45	0.54	315.57
18	26.01	5.37	190.56	3	15.07	0.42	302.34
19	25.93	5.28	177.35	4	14.69	0.30	289.10
20	25.84	5.20	164.15	5	14.31	0.18	275.87
21	-25.74	-5.11	150.94	6	-13.92	-0.06	262.63
22	25.64	5.02	137.73	7	13.52	+0.06	249.40
23	25.53	4.93	124.52	8	13.12	0.18	236.16
24	25.42	4.84	111.31	9	12.72	0.30	222.93
25	25.29	4.75	98.09	10	12.31	0.42	209.69
26	-25.16	-4.66	84.88	11	-11.90	+0.54	196.46
27	25.02	4.56	71.67	12	11.48	0.66	183.22
28	24.88	4.46	58.46	13	11.06	0.78	169.98
29	24.72	4.37	45.24	14	10.64	0.90	156.75
30	24.56	4.27	32.03	15	10.22	1.02	143.51
May 1	-24.39	-4.17	18.81	16	- 9.79	+1.14	130.27
2	24.22	4.07	5.59	17	9.36	1.26	117.04
3	24.04	3.96	352.38	18	8.92	1.38	103.80
4	23.85	3.86	339.16	19	8.48	1.50	90.56
5	23.65	3.76	325.94	20	8.04	1.61	77.32
6	-23.44	-3.65	312.72	21	- 7.60	+1.73	64.09
7	23.23	3.55	299.50	22	7.16	1.85	50.85
8	23.02	3.44	286.28	23	6.72	1.96	37.61
9	22.79	3.33	273.06	24	6.27	2.08	24.37
10	22.56	3.22	259.84	25	5.82	2.19	11.14
11	-22.32	-3.11	246.61	26	- 5.37	+2.31	357.90
12	22.07	3.00	233.39	27	4.92	2.42	344.66
13	21.82	2.89	220.16	28	4.47	2.54	331.43
14	21.56	2.78	206.94	29	4.01	2.65	318.19
15	21.30	2.67	193.72	30	3.56	2.76	304.96
16	-21.02	-2.55	180.49	July 1	- 3.10	+2.87	291.72
17	-20.74	-2.44	167.26	2	- 2.65	+2.98	278.48

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN

Date	P	B ₀	L ₀	Date	P	B ₀	L ₀
July 1	- 3.10	+2.87	291.72	Aug. 16	+16.11	+6.69	43.20
2	2.65	2.98	278.48	17	16.45	6.74	29.98
3	2.19	3.09	265.25	18	16.79	6.78	16.77
4	1.74	3.20	252.01	19	17.12	6.82	3.55
5	1.28	3.30	238.78	20	17.44	6.86	350.33
6	- 0.82	+3.41	225.54	21	+17.76	+6.90	337.12
7	- 0.37	3.52	212.31	22	18.08	6.94	323.90
8	+ 0.09	3.62	199.07	23	18.38	6.97	310.69
9	0.54	3.73	185.84	24	18.69	7.00	297.48
10	1.00	3.83	172.60	25	18.99	7.03	284.26
11	+ 1.45	+3.93	159.37	26	+19.28	+7.06	271.05
12	1.90	4.03	146.14	27	19.57	7.09	257.84
13	2.35	4.13	132.90	28	19.86	7.11	244.62
14	2.80	4.23	119.67	29	20.14	7.14	231.41
15	3.25	4.33	106.43	30	20.41	7.16	218.20
16	+ 3.69	+4.42	93.20	31	+20.68	+7.18	204.99
17	4.14	4.52	79.97	Sept. 1	20.94	7.19	191.78
18	4.58	4.61	66.74	2	21.20	7.21	178.58
19	5.02	4.70	53.50	3	21.45	7.22	165.37
20	5.46	4.80	40.27	4	21.69	7.23	152.16
21	+ 5.89	+4.88	27.04	5	+21.93	+7.24	138.95
22	6.33	4.97	13.81	6	22.17	7.24	125.75
23	6.76	5.06	0.58	7	22.40	7.25	112.54
24	7.19	5.15	347.35	8	22.62	7.25	99.33
25	7.61	5.23	334.12	9	22.84	7.25	86.13
26	+ 8.04	+5.32	320.89	10	+23.05	+7.25	72.92
27	8.46	5.40	307.66	11	23.25	7.24	59.72
28	8.88	5.48	294.44	12	23.45	7.24	46.51
29	9.29	5.56	281.21	13	23.64	7.23	33.31
30	9.70	5.63	267.98	14	23.83	7.22	20.11
31	+10.11	+5.71	254.76	15	+24.01	+7.20	6.90
Aug. 1	10.51	5.78	241.53	16	24.19	7.19	353.70
2	10.91	5.85	228.31	17	24.36	7.17	340.50
3	11.31	5.92	215.08	18	24.52	7.16	327.30
4	11.70	5.99	201.86	19	24.67	7.13	314.10
5	+12.10	+6.06	188.63	20	+24.82	+7.11	300.90
6	12.48	6.13	175.41	21	24.96	7.08	287.70
7	12.86	6.19	162.19	22	25.10	7.06	274.50
8	13.24	6.25	148.96	23	25.23	7.03	261.30
9	13.62	6.31	135.74	24	25.35	7.00	248.10
10	+13.98	+6.37	122.52	25	+25.47	+6.96	234.90
11	14.35	6.43	109.30	26	25.58	6.93	221.70
12	14.71	6.48	96.08	27	25.69	6.89	208.51
13	15.07	6.54	82.86	28	25.78	6.85	195.31
14	15.42	6.59	69.64	29	25.87	6.81	182.12
15	+15.77	+6.64	56.42	30	+25.96	+6.76	168.92
16	+16.11	+6.69	43.20	Oct. 1	+26.03	+6.72	155.72

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN

Date	P	B ₀	L ₀	Date	P	B ₀	L ₀
Oct. 1	+26.03	+6.72	155.72	Nov. 16	+21.45	+2.73	269.05
2	26.10	6.67	142.53	17	21.16	2.61	255.87
3	26.16	6.62	129.34	18	20.88	2.49	242.69
4	26.22	6.57	116.14	19	20.58	2.37	229.51
5	26.26	6.52	102.95	20	20.28	2.25	216.33
6	+26.30	+6.46	89.75	21	+19.97	+2.13	203.14
7	26.34	6.40	76.56	22	19.65	2.01	189.96
8	26.36	6.34	63.36	23	19.32	1.88	176.78
9	26.38	6.28	50.17	24	18.99	1.76	163.60
10	26.40	6.22	36.98	25	18.65	1.64	150.42
11	+26.40	+6.15	23.79	26	+18.31	+1.51	137.24
12	26.39	6.08	10.60	27	17.95	1.39	124.06
13	26.39	6.02	357.40	28	17.60	1.26	110.88
14	26.37	5.95	344.21	29	17.23	1.14	97.71
15	26.35	5.87	331.02	30	16.86	1.01	84.53
16	+26.31	+5.80	317.83	Dec. 1	+16.48	+0.88	71.35
17	26.27	5.72	304.64	2	16.09	0.75	58.17
18	26.22	5.64	291.45	3	15.70	0.63	44.99
19	26.17	5.56	278.26	4	15.31	0.50	31.81
20	26.11	5.48	265.07	5	14.90	0.37	18.64
21	+26.04	+5.40	251.88	6	+14.50	+0.24	5.46
22	25.96	5.31	238.69	7	14.09	+0.12	352.28
23	25.87	5.23	225.50	8	13.67	-0.01	339.10
24	25.78	5.14	212.31	9	13.24	0.14	325.93
25	25.67	5.05	199.13	10	12.82	0.27	312.75
26	+25.56	+4.96	185.94	11	+12.38	-0.40	299.57
27	25.45	4.86	172.75	12	11.95	0.52	286.40
28	25.32	4.77	159.56	13	11.51	0.65	273.22
29	25.19	4.68	146.38	14	11.06	0.78	260.05
30	25.05	4.58	133.19	15	10.61	0.91	246.87
31	+24.90	+4.48	120.00	16	+10.16	-1.04	233.70
Nov. 1	24.74	4.38	106.82	17	9.70	1.16	220.52
2	24.58	4.28	93.63	18	9.24	1.29	207.35
3	24.40	4.18	80.45	19	8.78	1.42	194.17
4	24.22	4.07	67.26	20	8.31	1.54	181.00
5	+24.04	+3.96	54.08	21	+7.84	-1.67	167.83
6	23.84	3.86	40.89	22	7.37	1.79	154.65
7	23.63	3.75	27.71	23	6.90	1.92	141.48
8	23.42	3.64	14.52	24	6.42	2.04	128.31
9	23.20	3.53	1.34	25	5.94	2.16	115.14
10	+22.98	+3.42	348.16	26	+5.46	-2.29	101.97
11	22.74	3.31	334.97	27	4.98	2.41	88.79
12	22.50	3.19	321.79	28	4.49	2.53	75.62
13	22.24	3.08	308.60	29	4.01	2.65	62.45
14	21.99	2.96	295.42	30	3.52	2.77	49.28
15	+21.72	+2.85	282.24	31	+3.04	-2.89	36.11
16	+21.45	+2.73	269.05	32	+2.55	-3.00	22.94

TABLE FOR OPTICAL LIBRATION OF THE MOON

The sign is to be taken from the same side as the argument.

$\lambda - \Omega$	μ	A	B	$\lambda - \Omega$	$\lambda - \Omega$	μ	A	B	$\lambda - \Omega$
0	+0.000+	+0.0268-	-0.000+	180	45	+0.010+	+0.0189-	-1.085+	225
1	.000	.0268	.027	181	46	.010	.0186	.104	226
2	.001	.0268	.054	182	47	.010	.0183	.123	227
3	.001	.0268	.080	183	48	.010	.0179	.141	228
4	.001	.0267	.107	184	49	.010	.0176	.159	229
5	+0.002+	+0.0267-	-0.134+	185	50	+0.010+	+0.0172-	-1.176+	230
6	.002	.0266	.160	186	51	.010	.0169	.193	231
7	.002	.0266	.187	187	52	.010	.0165	.210	232
8	.003	.0265	.214	188	53	.010	.0161	.226	233
9	.003	.0265	.240	189	54	.010	.0157	.242	234
10	+0.004+	+0.0264-	-0.267+	190	55	+0.010+	+0.0154-	-1.258+	235
11	.004	.0263	.293	191	56	.010	.0150	.273	236
12	.004	.0262	.319	192	57	.009	.0146	.287	237
13	.005	.0261	.345	193	58	.009	.0142	.302	238
14	.005	.0260	.371	194	59	.009	.0138	.316	239
15	+0.005+	+0.0259-	-0.397+	195	60	+0.009+	+0.0134-	-1.329+	240
16	.005	.0257	.423	196	61	.009	.0130	.343	241
17	.006	.0256	.449	197	62	.009	.0126	.355	242
18	.006	.0255	.474	198	63	.008	.0122	.368	243
19	.006	.0253	.500	199	64	.008	.0117	.380	244
20	+0.007+	+0.0252-	-0.525+	200	65	+0.008+	+0.0113-	-1.391+	245
21	.007	.0250	.550	201	66	.008	.0109	.402	246
22	.007	.0248	.575	202	67	.007	.0105	.413	247
23	.007	.0247	.600	203	68	.007	.0100	.423	248
24	.008	.0245	.624	204	69	.007	.0096	.433	249
25	+0.008+	+0.0243-	-0.649+	205	70	+0.007+	+0.0092-	-1.442+	250
26	.008	.0241	.673	206	71	.006	.0087	.451	251
27	.008	.0239	.697	207	72	.006	.0083	.460	252
28	.009	.0237	.721	208	73	.006	.0078	.468	253
29	.009	.0234	.744	209	74	.005	.0074	.476	254
30	+0.009+	+0.0232-	-0.768+	210	75	+0.005+	+0.0069-	-1.483+	255
31	.009	.0230	.791	211	76	.005	.0065	.489	256
32	.009	.0227	.814	212	77	.005	.0060	.496	257
33	.009	.0225	.836	213	78	.004	.0056	.502	258
34	.010	.0222	.859	214	79	.004	.0051	.507	259
35	+0.010+	+0.0219-	-0.881+	215	80	+0.004+	+0.0047-	-1.512+	260
36	.010	.0217	.902	216	81	.003	.0042	.516	261
37	.010	.0214	.924	217	82	.003	.0037	.520	262
38	.010	.0211	.945	218	83	.002	.0033	.524	263
39	.010	.0208	.966	219	84	.002	.0028	.527	264
40	+0.010+	+0.0205-	-0.987+	220	85	+0.002+	+0.0023-	-1.529+	265
41	.010	.0202	1.007	221	86	.001	.0019	.531	266
42	.010	.0199	.027	222	87	.001	.0014	.533	267
43	.010	.0196	.047	223	88	.001	.0009	.534	268
44	.010	.0193	.066	224	89	.000	.0005	.535	269
45	+0.010+	+0.0189-	-1.085+	225	90	+0.000+	+0.0000-	-1.535+	270

$$l' = \lambda + \mu + Ab' - C \quad b' = B - \beta$$

TABLE FOR OPTICAL LIBRATION OF THE MOON

The sign is to be taken from the same side as the argument.

$\lambda - \Omega$	μ	A	B	$\lambda - \Omega$	$\lambda - \Omega$	μ	A	B	$\lambda - \Omega$
90	-0.000	-0.0000	-1.535	270	135	-0.010	-0.0189	-1.085	315
91	.000	.0005	.535	271	136	.010	.0193	.066	316
92	.001	.0009	.534	272	137	.010	.0196	.047	317
93	.001	.0014	.533	273	138	.010	.0199	.027	318
94	.001	.0019	.531	274	139	.010	.0202	1.007	319
95	-0.002	-0.0023	-1.529	275	140	-0.010	-0.0205	-0.987	320
96	.002	.0028	.527	276	141	.010	.0208	.966	321
97	.002	.0033	.524	277	142	.010	.0211	.945	322
98	.003	.0037	.520	278	143	.010	.0214	.924	323
99	.003	.0042	.516	279	144	.010	.0217	.902	324
100	-0.004	-0.0047	-1.512	280	145	-0.010	-0.0219	-0.881	325
101	.004	.0051	.507	281	146	.010	.0222	.859	326
102	.004	.0056	.502	282	147	.009	.0225	.836	327
103	.005	.0060	.496	283	148	.009	.0227	.814	328
104	.005	.0065	.489	284	149	.009	.0230	.791	329
105	-0.005	-0.0069	-1.483	285	150	-0.009	-0.0232	-0.768	330
106	.005	.0074	.476	286	151	.009	.0234	.744	331
107	.006	.0078	.468	287	152	.009	.0237	.721	332
108	.006	.0083	.460	288	153	.008	.0239	.697	333
109	.006	.0087	.451	289	154	.008	.0241	.673	334
110	-0.007	-0.0092	-1.442	290	155	-0.008	-0.0243	-0.649	335
111	.007	.0096	.433	291	156	.008	.0245	.624	336
112	.007	.0100	.423	292	157	.007	.0247	.600	337
113	.007	.0105	.413	293	158	.007	.0248	.575	338
114	.008	.0109	.402	294	159	.007	.0250	.550	339
115	-0.008	-0.0113	-1.391	295	160	-0.007	-0.0252	-0.525	340
116	.008	.0117	.380	296	161	.006	.0253	.500	341
117	.008	.0122	.368	297	162	.006	.0255	.474	342
118	.009	.0126	.355	298	163	.006	.0256	.449	343
119	.009	.0130	.343	299	164	.005	.0257	.423	344
120	-0.009	-0.0134	-1.329	300	165	-0.005	-0.0259	-0.397	345
121	.009	.0138	.316	301	166	.005	.0260	.371	346
122	.009	.0142	.302	302	167	.005	.0261	.345	347
123	.009	.0146	.287	303	168	.004	.0262	.319	348
124	.010	.0150	.273	304	169	.004	.0263	.293	349
125	-0.010	-0.0154	-1.258	305	170	-0.004	-0.0264	-0.267	350
126	.010	.0157	.242	306	171	.003	.0265	.240	351
127	.010	.0161	.226	307	172	.003	.0265	.214	352
128	.010	.0165	.210	308	173	.002	.0266	.187	353
129	.010	.0169	.193	309	174	.002	.0266	.160	354
130	-0.010	-0.0172	-1.176	310	175	-0.002	-0.0267	-0.134	355
131	.010	.0176	.159	311	176	.001	.0267	.107	356
132	.010	.0179	.141	312	177	.001	.0268	.080	357
133	.010	.0183	.123	313	178	.001	.0268	.054	358
134	.010	.0186	.104	314	179	.000	.0268	.027	359
135	-0.010	-0.0189	-1.085	315	180	-0.000	-0.0268	-0.000	360

$$l' = \lambda + \mu + Ab' - a \quad b' = B - \beta$$

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON

Date	The Earth's Selenographic		Physical Libration		The Sun's Selenographic		Position Angle of		Fraction Illuminated
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	Moon's Axis	Terminator	
Jan. 1	-7.04	+6.65	-0.01	+0.01	221.14	-0.60	18.18	14.4	0.22
2	6.60	6.12	0.01	0.01	233.32	0.57	14.22	8.6	0.14
3	5.73	5.22	0.01	0.01	245.50	0.55	9.06	1.2	0.07
4	4.48	3.96	0.01	0.01	257.69	0.52	3.04	351.9	0.02
5	2.93	2.42	0.01	0.01	269.88	0.49	356.76	324.5	0.00
6	-1.20	+0.69	-0.01	+0.01	282.07	-0.46	350.86	352.0	0.01
7	+0.59	-1.09	0.00	0.01	294.26	0.43	345.81	342.4	0.05
8	2.30	2.79	0.00	0.01	306.45	0.40	341.87	337.8	0.11
9	3.82	4.28	0.00	0.01	318.63	0.37	339.12	335.4	0.20
10	5.07	5.47	0.00	0.01	330.80	0.34	337.56	334.7	0.30
11	+6.01	-6.29	0.00	+0.01	342.97	-0.31	337.18	335.6	0.40
12	6.60	6.73	0.00	0.01	355.14	0.29	338.00	337.9	0.51
13	6.86	6.79	0.00	0.01	7.29	0.26	339.99	341.4	0.62
14	6.79	6.49	0.00	0.01	19.44	0.23	343.11	346.0	0.72
15	6.43	5.87	0.00	0.01	31.58	0.20	347.21	351.5	0.81
16	+5.81	-4.98	0.00	+0.01	43.72	-0.17	352.03	357.6	0.88
17	4.97	3.87	0.00	0.01	55.86	0.14	357.22	3.8	0.94
18	3.94	2.59	0.00	0.01	67.99	0.11	2.42	9.9	0.98
19	2.77	-1.21	0.00	0.01	80.12	0.08	7.30	16.3	1.00
20	1.48	+0.21	-0.01	0.01	92.25	0.05	11.64	15.6	1.00
21	+0.11	+1.61	-0.01	+0.01	104.38	-0.02	15.33	21.6	0.98
22	-1.29	2.94	0.01	0.01	116.52	+0.01	18.30	24.5	0.95
23	2.68	4.14	0.01	0.01	128.65	0.04	20.55	26.2	0.90
24	4.00	5.17	0.01	0.01	140.79	0.07	22.05	26.8	0.84
25	5.22	5.99	0.01	0.01	152.94	0.09	22.77	26.4	0.77
26	-6.26	+6.55	-0.01	+0.01	165.08	+0.12	22.62	25.0	0.68
27	7.06	6.82	0.01	0.01	177.24	0.14	21.52	22.6	0.58
28	7.55	6.78	0.02	0.01	189.40	0.17	19.32	18.9	0.48
29	7.69	6.39	0.02	0.01	201.57	0.19	15.94	14.2	0.38
30	7.42	5.65	0.02	0.01	213.74	0.21	11.38	8.4	0.28
31	-6.71	+4.55	-0.02	+0.01	225.92	+0.24	5.82	1.8	0.18
Feb. 1	5.58	3.15	0.01	0.01	238.11	0.27	359.69	355.2	0.10
2	4.06	+1.50	0.01	0.01	250.30	0.29	353.59	349.5	0.04
3	2.24	-0.29	0.01	0.01	262.49	0.32	348.06	347.9	0.01
4	-0.25	2.07	0.01	0.01	274.69	0.35	343.51	322.4	0.00
5	+1.77	-3.70	-0.01	+0.01	286.88	+0.38	340.13	330.5	0.03
6	3.65	5.06	0.01	0.01	299.08	0.41	338.00	330.9	0.08
7	5.26	6.05	0.01	0.01	311.26	0.44	337.15	332.0	0.16
8	6.50	6.63	0.01	0.01	323.45	0.47	337.58	334.3	0.25
9	7.29	6.79	0.01	0.01	335.63	0.50	339.27	337.7	0.35
10	+7.62	-6.57	-0.01	+0.01	347.80	+0.53	342.16	342.2	0.46
11	7.53	6.01	0.01	0.01	359.97	0.56	346.09	347.4	0.56
12	7.06	5.16	0.01	0.02	12.13	0.59	350.80	353.2	0.66
13	6.27	4.09	0.01	0.02	24.28	0.62	355.95	359.1	0.75
14	5.23	2.86	0.01	0.02	36.43	0.65	1.16	4.6	0.83
15	+4.01	-1.51	-0.01	+0.02	48.58	+0.68	6.12	9.2	0.90
16	+2.68	-0.11	-0.01	+0.02	60.72	+0.71	10.59	12.4	0.95

MOON, 1935

571

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON

Date	The Earth's Selenographic		Physical Libration		The Sun's Selenographic		Position Angle of		Fraction Illuminated
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	Moon's Axis	Terminator	
Feb. 16	+2.68	-0.11	-0.01	+0.02	60.72	+0.71	10.59	12.4	0.95
17	+1.28	+1.28	0.01	0.02	72.87	0.73	14.45	12.6	0.98
18	-0.12	2.62	0.02	0.02	85.01	0.76	17.61	357.7	1.00
19	1.49	3.85	0.02	0.02	97.14	0.79	20.06	48.4	1.00
20	2.80	4.91	0.02	0.02	109.28	0.81	21.77	35.3	0.98
21	-4.02	+5.77	-0.02	+0.02	121.43	+0.83	22.69	31.9	0.94
22	5.10	6.37	0.02	0.02	133.57	0.85	22.77	29.4	0.89
23	6.03	6.70	0.02	0.02	145.72	0.87	21.93	26.5	0.82
24	6.76	6.72	0.02	0.02	157.88	0.89	20.05	22.7	0.74
25	7.25	6.42	0.02	0.02	170.04	0.91	17.06	18.1	0.65
26	-7.47	+5.79	-0.02	+0.02	182.20	+0.92	12.96	12.6	0.55
27	7.35	4.84	0.02	0.02	194.38	0.94	7.86	6.3	0.44
28	6.87	3.59	0.02	0.02	206.56	0.96	2.09	359.8	0.33
Mar. 1	6.00	2.09	0.02	0.02	218.75	0.97	356.10	353.6	0.23
2	4.73	+0.42	0.02	0.02	230.94	0.99	350.43	348.6	0.14
3	-3.11	-1.32	-0.02	+0.02	243.14	+1.01	345.49	345.8	0.07
4	-1.23	2.98	0.02	0.02	255.35	1.03	341.57	348.3	0.02
5	+0.80	4.45	0.02	0.02	267.55	1.05	338.82	42.9	0.00
6	2.78	5.60	0.02	0.02	279.76	1.07	337.35	317.9	0.01
7	4.58	6.34	0.01	0.02	291.97	1.10	337.20	327.1	0.05
8	+6.02	-6.65	-0.01	+0.02	304.17	+1.12	338.42	332.3	0.12
9	7.01	6.54	0.01	0.02	316.37	1.14	340.96	337.5	0.20
10	7.50	6.05	0.01	0.02	328.57	1.17	344.68	343.3	0.30
11	7.50	5.26	0.01	0.02	340.76	1.19	349.30	349.4	0.40
12	7.06	4.22	0.01	0.02	352.94	1.21	354.46	355.7	0.50
13	+6.24	-3.01	-0.02	+0.02	5.12	+1.23	359.76	1.6	0.60
14	5.14	1.69	0.02	0.02	17.29	1.26	4.85	6.9	0.69
15	3.85	-0.32	0.02	0.02	29.46	1.28	9.48	11.2	0.77
16	2.45	+1.06	0.02	0.02	41.62	1.30	13.51	14.3	0.85
17	+1.03	2.38	0.02	0.02	53.78	1.32	16.86	15.8	0.91
18	-0.36	+3.60	-0.02	+0.02	65.94	+1.34	19.51	14.8	0.96
19	1.67	4.67	0.02	0.02	78.09	1.35	21.42	8.1	0.99
20	2.85	5.55	0.02	0.02	90.25	1.37	22.57	324.5	1.00
21	3.89	6.18	0.02	0.02	102.40	1.38	22.87	52.0	0.99
22	4.76	6.54	0.03	0.02	114.56	1.39	22.25	36.0	0.97
23	-5.47	+6.60	-0.03	+0.02	126.72	+1.40	20.62	28.7	0.93
24	6.00	6.33	0.03	0.02	138.88	1.40	17.88	22.6	0.87
25	6.34	5.76	0.03	0.02	151.04	1.40	14.04	16.4	0.79
26	6.47	4.87	0.03	0.02	163.21	1.41	9.23	9.8	0.70
27	6.36	3.70	0.02	0.02	175.39	1.41	3.71	3.0	0.60
28	-5.99	+2.31	-0.02	+0.02	187.58	+1.41	357.90	356.4	0.49
29	5.32	+0.75	0.02	0.02	199.77	1.42	352.26	350.6	0.37
30	4.34	-0.89	0.02	0.02	211.97	1.42	347.20	346.1	0.27
31	3.03	2.50	0.02	0.02	224.18	1.43	343.00	343.3	0.17
Apr. 1	-1.47	3.97	0.02	0.02	236.39	1.43	339.83	343.0	0.09
2	+0.28	-5.18	-0.02	+0.02	248.61	+1.44	337.81	347.1	0.03
3	+2.06	-6.04	-0.02	+0.02	260.83	+1.45	337.07	9.7	0.00

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON

Date	The Earth's Selenographic		Physical Libration		The Sun's Selenographic		Position Angle of		Fraction Illum- inated	
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	Moon's Axis	Termin- ator		
Apr.	1	-1.47	-3.97	-0.02	+0.02	236.39	+1.43	339.83	343.0	0.09
	2	+0.28	5.18	0.02	0.02	248.61	1.44	337.81	347.1	0.03
	3	2.06	6.04	0.02	0.02	260.83	1.45	337.07	9.7	0.00
	4	3.74	6.48	0.02	0.02	273.05	1.46	337.68	301.4	0.00
	5	5.14	6.49	0.02	0.02	285.28	1.47	339.68	326.7	0.03
	6	+6.15	-6.10	-0.02	+0.02	297.50	+1.48	343.00	336.5	0.08
	7	6.70	5.36	0.02	0.02	309.72	1.49	347.42	344.4	0.15
	8	6.77	4.35	0.02	0.02	321.93	1.50	352.56	351.7	0.24
	9	6.38	3.15	0.02	0.02	334.14	1.51	357.99	358.5	0.33
	10	5.60	1.82	0.02	0.02	346.34	1.52	3.27	4.6	0.43
	11	+4.53	-0.45	-0.02	+0.02	358.54	+1.54	8.13	9.7	0.53
	12	3.25	+0.92	0.02	0.02	10.73	1.55	12.39	13.8	0.62
	13	1.87	2.24	0.02	0.02	22.92	1.56	15.96	16.6	0.71
	14	+0.46	3.46	0.02	0.02	35.10	1.56	18.83	18.3	0.79
	15	-0.88	4.54	0.02	0.02	47.28	1.57	20.97	18.5	0.86
	16	-2.09	+5.43	-0.02	+0.02	59.45	+1.57	22.35	16.8	0.92
	17	3.13	6.08	0.02	0.02	71.62	1.58	22.91	11.9	0.96
	18	3.96	6.47	0.03	0.02	83.80	1.58	22.56	357.2	0.99
	19	4.59	6.55	0.03	0.02	95.96	1.57	21.19	275.7	1.00
	20	5.00	6.31	0.03	0.02	108.14	1.56	18.71	38.1	0.99
	21	-5.23	+5.75	-0.03	+0.02	120.31	+1.55	15.09	23.6	0.95
	22	5.27	4.88	0.03	0.02	132.48	1.54	10.43	14.3	0.90
	23	5.15	3.73	0.02	0.02	144.66	1.53	5.01	6.2	0.82
	24	4.86	2.36	0.02	0.02	156.84	1.52	359.23	358.8	0.73
	25	4.40	+0.84	0.02	0.02	169.03	1.51	353.58	352.2	0.63
	26	-3.75	-0.76	-0.02	+0.02	181.23	+1.50	348.44	346.9	0.52
	27	2.90	2.32	0.02	0.02	193.44	1.49	344.09	343.0	0.41
	28	1.84	3.77	0.02	0.02	205.65	1.48	340.69	340.7	0.30
	29	-0.60	4.99	0.02	0.02	217.87	1.47	338.34	340.3	0.20
	30	+0.76	5.89	0.02	0.02	230.10	1.46	337.15	342.1	0.11
May	1	+2.14	-6.41	-0.02	+0.02	242.33	+1.45	337.23	347.2	0.05
	2	3.45	6.52	0.02	0.02	254.57	1.45	338.65	1.2	0.01
	3	4.55	6.22	0.02	0.02	266.80	1.44	341.44	87.2	0.00
	4	5.34	5.55	0.02	0.02	279.04	1.44	345.47	330.0	0.02
	5	5.75	4.58	0.02	0.02	291.28	1.44	350.43	344.6	0.05
	6	+5.74	-3.38	-0.02	+0.02	303.51	+1.44	355.88	354.0	0.11
	7	5.33	2.04	0.02	0.02	315.74	1.43	1.36	1.5	0.19
	8	4.57	-0.64	0.02	0.02	327.97	1.43	6.48	7.8	0.27
	9	3.52	+0.77	0.02	0.02	340.19	1.43	11.02	12.7	0.36
	10	2.28	2.12	0.02	0.03	352.41	1.43	14.87	16.5	0.45
	11	+0.94	+3.37	-0.02	+0.03	4.62	+1.42	17.99	19.1	0.55
	12	-0.42	4.47	0.02	0.03	16.82	1.42	20.38	20.5	0.64
	13	1.71	5.39	0.02	0.03	29.02	1.42	22.02	20.8	0.73
	14	2.84	6.07	0.02	0.03	41.22	1.41	22.87	19.9	0.81
	15	3.77	6.50	0.02	0.03	53.41	1.40	22.83	17.4	0.88
	16	-4.44	+6.63	-0.02	+0.03	65.60	+1.39	21.80	12.7	0.94
	17	-4.84	+6.44	-0.02	+0.03	77.78	+1.37	19.67	3.8	0.98

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON

Date	The Earth's Selenographic		Physical Libration		The Sun's Selenographic		Position Angle of		Fraction Illuminated
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	Moon's Axis	Terminator	
May 17	-4.84	+6.44	-0.02	+0.03	77.78	+1.37	19.67	3.8	0.98
18	4.98	5.91	0.02	0.03	89.96	1.35	16.35	334.3	1.00
19	4.86	5.06	0.02	0.03	102.15	1.33	11.90	38.8	1.00
20	4.54	3.91	0.02	0.03	114.33	1.31	6.55	13.5	0.97
21	4.04	2.52	0.02	0.02	126.52	1.28	0.72	2.3	0.92
22	-3.41	+0.97	-0.02	+0.02	138.70	+1.26	354.90	354.1	0.85
23	2.66	-0.65	0.02	0.02	150.90	1.23	349.56	347.7	0.76
24	1.81	2.25	0.02	0.02	163.10	1.21	344.99	343.0	0.66
25	-0.89	3.71	0.01	0.02	175.31	1.18	341.37	339.8	0.55
26	+0.10	4.95	0.01	0.02	187.52	1.16	338.79	338.3	0.43
27	+1.13	-5.89	-0.01	+0.02	199.75	+1.14	337.32	338.4	0.32
28	2.16	6.46	0.01	0.02	211.98	1.12	337.03	340.1	0.22
29	3.14	6.64	0.01	0.02	224.22	1.10	338.01	343.6	0.13
30	3.99	6.42	0.01	0.02	236.46	1.08	340.31	349.4	0.07
31	4.64	5.82	0.01	0.02	248.70	1.06	343.87	359.2	0.02
June 1	+5.04	-4.90	-0.01	+0.03	260.95	+1.04	348.49	32.3	0.00
2	5.13	3.74	0.01	0.03	273.20	1.03	353.80	336.0	0.01
3	4.90	2.39	0.01	0.03	285.45	1.01	359.34	355.8	0.03
4	4.34	-0.96	0.01	0.03	297.70	1.00	4.67	5.0	0.08
5	3.51	+0.49	0.01	0.03	309.94	0.99	9.49	11.4	0.14
6	+2.44	+1.90	-0.01	+0.03	322.18	+0.98	13.63	16.2	0.21
7	+1.20	3.20	0.01	0.03	334.41	0.97	17.03	19.5	0.29
8	-0.12	4.36	0.01	0.03	346.64	0.96	19.69	21.7	0.38
9	1.45	5.33	0.01	0.03	358.87	0.94	21.59	22.8	0.48
10	2.71	6.07	0.01	0.03	11.08	0.93	22.71	22.8	0.57
11	-3.80	+6.56	-0.02	+0.03	23.30	+0.91	23.00	21.6	0.67
12	4.68	6.76	0.02	0.03	35.50	0.90	22.34	19.4	0.75
13	5.27	6.65	0.02	0.03	47.71	0.88	20.63	15.8	0.84
14	5.54	6.20	0.02	0.03	59.90	0.85	17.75	10.6	0.91
15	5.48	5.42	0.02	0.03	72.10	0.83	13.67	3.3	0.96
16	-5.11	+4.32	-0.01	+0.03	84.29	+0.80	8.56	350.8	0.99
17	4.44	2.95	0.01	0.03	96.48	0.77	2.74	49.7	1.00
18	3.55	+1.37	0.01	0.03	108.67	0.73	356.72	359.0	0.98
19	2.48	-0.32	0.01	0.03	120.86	0.70	351.05	349.0	0.94
20	1.31	1.99	0.01	0.03	133.06	0.66	346.12	342.9	0.87
21	-0.11	-3.54	-0.01	+0.03	145.26	+0.63	342.16	338.9	0.78
22	+1.08	4.86	0.01	0.03	157.46	0.59	339.27	336.7	0.68
23	2.20	5.87	0.01	0.03	169.68	0.56	337.51	336.1	0.57
24	3.20	6.52	-0.01	0.03	181.90	0.53	336.94	337.0	0.45
25	4.05	6.76	0.00	0.03	194.13	0.50	337.61	339.3	0.34
26	+4.71	-6.60	0.00	+0.03	206.36	+0.47	339.55	343.0	0.24
27	5.16	6.08	0.00	0.03	218.60	0.44	342.74	347.9	0.15
28	5.37	5.22	0.00	0.03	230.84	0.42	347.03	354.0	0.08
29	5.33	4.11	0.00	0.03	243.10	0.40	352.10	1.3	0.04
30	5.04	2.80	0.00	0.03	255.35	0.37	357.56	11.5	0.01
July 1	+4.50	-1.37	0.00	+0.03	267.60	+0.35	2.96	337.1	0.00
2	+3.72	+0.10	0.00	+0.03	279.85	+0.33	7.97	9.8	0.01

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON

Date	The Earth's Selenographic		Physical Libration		The Sun's Selenographic		Position Angle of		Fraction Illuminated
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	Moon's Axis	Terminator	
July 1	+4.50	-1.37	0.00	+0.03	267.60	+0.35	2.96	337.1	0.00
2	3.72	+0.10	0.00	0.03	279.85	0.33	7.97	9.8	0.01
3	2.73	1.55	0.00	0.03	292.10	0.31	12.35	16.4	0.05
4	1.58	2.91	0.00	0.03	304.35	0.29	16.02	20.5	0.10
5	+0.32	4.12	0.00	0.03	316.60	0.28	18.93	23.2	0.16
6	-1.01	+5.16	-0.01	+0.03	328.84	+0.26	21.09	24.7	0.23
7	2.34	5.97	0.01	0.03	341.08	0.24	22.47	25.1	0.32
8	3.59	6.54	0.01	0.03	353.31	0.22	23.04	24.4	0.41
9	4.69	6.82	0.01	0.03	5.53	0.20	22.73	22.8	0.51
10	5.58	6.80	0.01	0.03	17.75	0.18	21.42	20.1	0.60
11	-6.18	+6.47	-0.01	+0.03	29.96	+0.16	19.02	16.4	0.70
12	6.45	5.80	0.01	0.03	42.17	0.14	15.45	11.5	0.79
13	6.34	4.81	0.01	0.03	54.37	0.11	10.75	5.6	0.87
14	5.84	3.53	0.01	0.03	66.57	0.08	5.17	359.1	0.94
15	4.98	1.99	-0.01	0.03	78.76	0.05	359.14	352.5	0.98
16	-3.78	+0.30	0.00	+0.03	90.95	+0.01	353.19	347.4	1.00
17	2.33	-1.44	0.00	0.03	103.14	-0.02	347.82	340.4	0.99
18	-0.73	3.10	0.00	0.03	115.33	0.06	343.36	336.8	0.95
19	+0.91	4.55	0.00	0.03	127.52	0.10	340.01	334.5	0.89
20	2.48	5.68	0.00	0.03	139.72	0.13	337.85	333.6	0.80
21	+3.87	-6.44	0.00	+0.03	151.93	-0.17	336.93	334.2	0.70
22	5.01	6.77	0.00	0.03	164.14	0.20	337.30	336.2	0.59
23	5.84	6.70	0.00	0.03	176.36	0.23	338.96	339.4	0.48
24	6.35	6.24	0.00	0.03	188.58	0.26	341.88	343.8	0.37
25	6.53	5.44	0.00	0.03	200.81	0.29	345.92	349.1	0.27
26	+6.41	-4.38	0.00	+0.03	213.05	-0.32	350.79	354.8	0.18
27	6.01	3.12	0.00	0.03	225.29	0.35	356.13	0.6	0.11
28	5.37	1.73	0.00	0.03	237.53	0.38	1.53	5.7	0.06
29	4.52	-0.27	0.00	0.03	249.78	0.40	6.63	9.1	0.02
30	3.51	+1.18	0.00	0.03	262.03	0.42	11.18	1.6	0.00
Aug. 1	+2.36	+2.55	0.00	+0.03	274.28	-0.44	15.05	32.6	0.00
2	+1.11	3.81	0.00	0.03	286.53	0.46	18.19	28.5	0.02
3	-0.20	4.89	0.00	0.03	298.77	0.48	20.57	28.5	0.06
4	1.54	5.76	0.00	0.03	311.02	0.50	22.19	28.4	0.11
5	2.85	6.38	0.00	0.03	323.26	0.52	23.00	27.6	0.18
6	-4.10	+6.74	0.00	+0.03	335.50	-0.53	22.96	26.0	0.26
7	5.21	6.80	0.00	0.03	347.72	0.55	21.98	23.5	0.35
8	6.14	6.57	0.00	0.03	359.95	0.57	19.97	20.1	0.44
9	6.81	6.02	0.00	0.03	12.16	0.59	16.87	15.7	0.55
10	7.16	5.16	0.00	0.03	24.38	0.61	12.67	10.4	0.65
11	-7.13	+4.01	0.00	+0.03	36.58	-0.63	7.52	4.5	0.74
12	6.68	2.60	0.00	0.03	48.78	0.65	1.71	358.5	0.83
13	5.80	+0.99	0.00	0.03	60.97	0.68	355.73	353.1	0.91
14	4.50	-0.73	0.00	0.03	73.16	0.71	350.06	350.0	0.97
15	2.84	2.43	0.00	0.03	85.34	0.74	345.13	357.7	1.00
16	-0.94	-3.98	+0.01	+0.03	97.52	-0.77	341.23	315.4	1.00
17	+1.07	-5.27	+0.01	+0.03	109.70	-0.80	338.51	327.1	0.97

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON

Date	The Earth's Selenographic		Physical Libration		The Sun's Selenographic		Position Angle of		Fraction Illuminated
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	Moon's Axis	Terminator	
Aug. 16	+1.07	-5.27	+0.01	+0.03	109.70	-0.80	338.51	327.1	0.97
17	3.01	6.17	0.01	0.03	121.89	0.83	337.08	329.7	0.91
18	4.72	6.64	0.01	0.03	134.08	0.86	337.01	332.4	0.83
19	6.10	6.66	0.01	0.03	146.27	0.89	338.32	335.8	0.73
20	7.05	6.28	0.01	0.03	158.47	0.92	340.98	340.3	0.62
21	+7.56	-5.55	+0.01	+0.03	170.68	-0.94	344.83	345.6	0.52
22	7.64	4.53	0.01	0.03	182.89	0.97	349.58	351.4	0.41
23	7.33	3.31	0.01	0.03	195.11	0.99	354.87	357.3	0.31
24	6.71	1.95	0.01	0.03	207.34	1.02	0.28	2.8	0.22
25	5.83	-0.53	0.01	0.03	219.56	1.04	5.45	7.5	0.14
26	+4.76	+0.90	+0.01	+0.03	231.80	-1.06	10.12	10.7	0.08
27	3.57	2.26	0.01	0.03	244.04	1.08	14.15	11.5	0.04
28	2.28	3.52	0.01	0.04	256.28	1.10	17.48	5.8	0.01
29	+0.96	4.62	0.01	0.04	268.51	1.12	20.06	298.6	0.00
30	-0.37	5.52	0.01	0.04	280.75	1.13	21.88	44.5	0.01
31	-1.69	+6.18	+0.01	+0.04	292.99	-1.14	22.90	35.4	0.04
Sept. 1	2.95	6.58	0.01	0.04	305.22	1.15	23.09	31.3	0.08
2	4.15	6.69	+0.01	0.04	317.46	1.16	22.36	27.7	0.14
3	5.23	6.51	0.00	0.04	329.68	1.17	20.65	23.9	0.21
4	6.16	6.03	0.00	0.03	341.91	1.18	17.89	19.3	0.29
5	-6.87	+5.26	0.00	+0.03	354.12	-1.19	14.08	14.1	0.39
6	7.31	4.22	0.00	0.03	6.33	1.20	9.33	8.2	0.49
7	7.41	2.94	+0.01	0.03	18.53	1.22	3.87	2.1	0.60
8	7.11	+1.46	0.01	0.03	30.72	1.23	358.07	356.1	0.70
9	6.37	-0.16	0.01	0.03	42.91	1.24	352.37	350.9	0.80
10	-5.18	-1.81	+0.01	+0.03	55.09	-1.26	347.19	347.4	0.88
11	3.56	3.38	0.01	0.03	67.27	1.28	342.84	346.8	0.95
12	-1.60	4.74	0.01	0.03	79.44	1.30	339.56	355.0	0.99
13	+0.55	5.78	0.01	0.03	91.61	1.32	337.52	273.3	1.00
14	2.69	6.40	0.01	0.03	103.78	1.34	336.84	320.4	0.98
15	+4.64	-6.57	+0.01	+0.03	115.95	-1.35	337.61	329.2	0.93
16	6.24	6.28	0.01	0.03	128.12	1.37	339.85	335.4	0.86
17	7.36	5.61	0.01	0.03	140.30	1.39	343.44	341.5	0.77
18	7.98	4.63	0.01	0.03	152.48	1.40	348.09	347.9	0.67
19	8.09	3.42	0.01	0.03	164.67	1.42	353.39	354.4	0.56
20	+7.76	-2.07	+0.01	+0.03	176.87	-1.43	358.89	0.5	0.46
21	7.06	-0.66	0.01	0.03	189.07	1.45	4.20	5.9	0.36
22	6.07	+0.75	0.01	0.04	201.28	1.46	9.03	10.3	0.27
23	4.90	2.11	0.01	0.04	213.49	1.47	13.24	13.5	0.19
24	3.60	3.36	0.01	0.04	225.71	1.48	16.74	15.1	0.12
25	+2.26	+4.45	+0.01	+0.04	237.93	-1.49	19.51	14.8	0.07
26	+0.91	5.36	0.01	0.04	250.15	1.50	21.53	10.7	0.03
27	-0.40	6.03	0.01	0.04	262.37	1.51	22.76	353.7	0.01
28	1.65	6.44	0.01	0.04	274.60	1.51	23.16	82.2	0.00
29	2.82	6.58	0.01	0.04	286.82	1.52	22.66	42.0	0.02
30	-3.89	+6.42	+0.01	+0.04	299.05	-1.52	21.17	31.2	0.05
Oct. 1	-4.84	+5.97	+0.01	+0.04	311.26	-1.52	18.66	24.2	0.10

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON

Date	The Earth's Selenographic		Physical Libration		The Sun's Selenographic		Position Angle of		Fraction Illuminated
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	Moon's Axis	Terminator	
Oct. 1	-4.84	+5.97	+0.01	+0.04	311.26	-1.52	18.66	24.2	0.10
2	5.67	5.24	0.01	0.04	323.48	1.51	15.11	17.8	0.16
3	6.32	4.25	0.01	0.04	335.69	1.51	10.62	11.4	0.24
4	6.75	3.03	0.01	0.04	347.89	1.51	5.41	4.9	0.34
5	6.91	1.63	0.01	0.03	0.09	1.51	359.81	358.5	0.44
6	-6.74	+0.11	+0.01	+0.03	12.28	-1.51	354.21	352.7	0.55
7	6.18	-1.46	0.01	0.03	24.46	1.51	348.98	347.9	0.66
8	5.21	2.99	0.01	0.03	36.63	1.51	344.44	344.5	0.76
9	3.82	4.36	0.01	0.03	48.80	1.51	340.79	343.0	0.85
10	2.07	5.46	0.01	0.03	60.96	1.51	338.24	344.3	0.93
11	-0.07	-6.20	+0.01	+0.03	73.11	-1.51	336.94	351.7	0.98
12	+1.99	6.50	0.01	0.03	85.26	1.51	337.04	38.2	1.00
13	3.94	6.34	0.01	0.03	97.42	1.51	338.65	316.0	0.99
14	5.58	5.76	0.02	0.03	109.57	1.51	341.75	333.1	0.95
15	6.80	4.81	0.02	0.03	121.73	1.52	346.13	342.5	0.89
16	+7.51	-3.61	+0.02	+0.04	133.89	-1.52	351.39	350.5	0.81
17	7.71	2.24	0.02	0.04	146.05	1.52	357.04	357.6	0.72
18	7.44	-0.80	0.01	0.04	158.22	1.52	2.58	3.9	0.62
19	6.78	+0.65	0.01	0.04	170.40	1.52	7.68	9.2	0.52
20	5.81	2.02	0.01	0.04	182.58	1.52	12.13	13.4	0.43
21	+4.63	+3.29	+0.01	+0.04	194.77	-1.52	15.87	16.3	0.33
22	3.32	4.40	0.01	0.04	206.96	1.52	18.85	18.0	0.25
23	1.98	5.31	0.01	0.04	219.16	1.52	21.09	18.5	0.17
24	+0.65	6.00	0.01	0.04	231.36	1.52	22.55	17.3	0.11
25	-0.61	6.43	0.01	0.04	243.57	1.52	23.18	14.0	0.06
26	-1.75	+6.58	+0.01	+0.04	255.78	-1.51	22.92	5.9	0.02
27	2.77	6.44	0.01	0.04	267.98	1.50	21.69	335.9	0.00
28	3.65	6.01	0.01	0.04	280.19	1.49	19.41	53.8	0.00
29	4.40	5.28	0.01	0.04	292.40	1.48	16.06	27.4	0.02
30	4.99	4.29	0.01	0.04	304.60	1.46	11.74	16.3	0.07
31	-5.42	+3.08	+0.01	+0.04	316.80	-1.45	6.64	7.9	0.12
Nov. 1	5.68	1.69	0.01	0.04	329.00	1.44	1.11	0.6	0.20
2	5.73	+0.18	0.01	0.04	341.19	1.42	355.54	354.1	0.29
3	5.53	-1.36	0.01	0.04	353.37	1.41	350.29	348.6	0.39
4	5.04	2.85	0.01	0.03	5.55	1.39	345.65	344.3	0.50
5	-4.24	-4.21	+0.01	+0.03	17.72	-1.37	341.83	341.4	0.62
6	3.12	5.33	0.01	0.03	29.88	1.36	338.98	340.2	0.72
7	1.71	6.13	0.01	0.03	42.03	1.34	337.24	340.7	0.82
8	-0.09	6.53	0.01	0.03	54.18	1.33	336.77	343.5	0.90
9	+1.62	6.49	0.01	0.03	66.32	1.31	337.72	350.1	0.96
10	+3.26	-6.02	+0.01	+0.03	78.46	-1.29	340.16	9.6	0.99
11	4.69	5.16	0.01	0.03	90.60	1.28	344.02	307.9	1.00
12	5.78	3.99	0.01	0.03	102.73	1.26	349.02	341.1	0.97
13	6.45	2.60	0.01	0.04	114.87	1.24	354.67	352.8	0.93
14	6.67	-1.11	0.01	0.04	127.02	1.23	0.44	1.1	0.86
15	+6.46	+0.40	+0.01	+0.04	139.16	-1.21	5.87	7.6	0.78
16	+5.87	+1.85	+0.01	+0.04	151.32	-1.20	10.67	12.8	0.69

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON

Date	The Earth's Selenographic		Physical Libration		The Sun's Selenographic		Position Angle of		Fraction Illuminated
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	Moon's Axis	Terminator	
Nov. 16	+5.87	+1.85	+0.01	+0.04	151.32	-1.20	10.67	12.8	0.69
17	4.97	3.18	0.01	0.04	163.48	1.19	14.73	16.6	0.60
18	3.84	4.34	0.01	0.04	175.64	1.17	18.01	19.2	0.50
19	2.58	5.31	0.01	0.04	187.81	1.16	20.51	20.7	0.41
20	+1.26	6.04	0.01	0.04	199.99	1.15	22.22	21.1	0.32
21	-0.03	+6.51	+0.01	+0.04	212.17	-1.14	23.12	20.4	0.23
22	1.23	6.70	0.01	0.04	224.35	1.13	23.15	18.4	0.16
23	2.29	6.61	+0.01	0.04	236.54	1.11	22.22	15.0	0.09
24	3.17	6.21	0.00	0.04	248.74	1.10	20.26	9.4	0.04
25	3.86	5.51	0.00	0.04	260.93	1.08	17.19	358.7	0.01
26	-4.34	+4.53	0.00	+0.04	273.13	-1.06	13.08	302.3	0.00
27	4.62	3.30	0.00	0.04	285.32	1.04	8.08	19.8	0.01
28	4.72	1.89	0.00	0.04	297.52	1.01	2.53	4.4	0.04
29	4.62	+0.35	0.00	0.04	309.71	0.99	356.85	355.6	0.09
30	4.35	-1.23	0.00	0.04	321.89	0.96	351.44	349.0	0.16
Dec. 1	-3.89	-2.76	0.00	+0.04	334.07	-0.93	346.62	344.0	0.25
2	3.25	4.15	+0.01	0.04	346.25	0.91	342.62	340.4	0.35
3	2.43	5.31	0.01	0.04	358.42	0.88	339.56	338.3	0.46
4	1.44	6.15	0.01	0.04	10.58	0.85	337.56	337.7	0.58
5	-0.31	6.62	0.01	0.04	22.73	0.82	336.73	338.6	0.69
6	+0.90	-6.68	+0.01	+0.04	34.87	-0.79	337.19	341.0	0.79
7	2.13	6.32	0.01	0.04	47.01	0.76	339.05	345.2	0.88
8	3.27	5.56	0.01	0.04	59.14	0.73	342.33	351.3	0.94
9	4.25	4.47	0.01	0.04	71.27	0.70	346.85	1.1	0.98
10	4.98	3.12	0.01	0.04	83.40	0.67	352.26	48.8	1.00
11	+5.39	-1.62	+0.01	+0.04	95.53	-0.64	358.05	353.0	0.99
12	5.47	-0.06	0.01	0.04	107.66	0.61	3.72	5.1	0.96
13	5.20	+1.46	0.01	0.04	119.79	0.58	8.87	12.0	0.91
14	4.62	2.88	+0.01	0.04	131.93	0.56	13.30	16.8	0.84
15	3.76	4.14	0.00	0.04	144.07	0.54	16.94	20.2	0.76
16	+2.68	+5.19	0.00	+0.04	156.22	-0.51	19.75	22.3	0.68
17	1.47	6.00	0.00	0.04	168.37	0.50	21.76	23.3	0.59
18	+0.19	6.54	0.00	0.04	180.53	0.48	22.95	23.3	0.49
19	-1.08	6.81	0.00	0.04	192.69	0.46	23.29	22.4	0.40
20	2.26	6.79	0.00	0.04	204.86	0.44	22.71	20.4	0.31
21	-3.30	+6.47	0.00	+0.04	217.03	-0.42	21.12	17.3	0.22
22	4.12	5.85	0.00	0.04	229.21	0.40	18.46	13.2	0.15
23	4.69	4.94	0.00	0.04	241.39	0.38	14.71	7.9	0.08
24	4.98	3.76	0.00	0.04	253.58	0.35	9.96	1.4	0.04
25	4.98	2.35	0.00	0.04	265.77	0.33	4.48	352.2	0.01
26	-4.70	+0.79	0.00	+0.04	277.96	-0.30	358.68	7.2	0.00
27	4.17	-0.85	0.00	0.04	290.15	0.27	353.01	349.1	0.02
28	3.42	2.46	0.00	0.04	302.33	0.24	347.87	342.9	0.06
29	2.50	3.93	0.00	0.04	314.52	0.21	343.53	338.9	0.13
30	1.47	5.17	0.00	0.04	326.70	0.18	340.16	336.4	0.21
31	-0.38	-6.10	0.00	+0.04	338.87	-0.15	337.88	335.3	0.32
32	+0.71	-6.64	0.00	+0.04	351.03	-0.11	336.77	335.7	0.43

MERCURY, 1935

ILLUMINATED DISC OF MERCURY

Date	<i>h</i>	<i>i</i>	θ	<i>L</i>	Stellar Mag.	Date	<i>h</i>	<i>i</i>	θ	<i>L</i>	Stellar Mag.
Jan. 1	0.999	4	69	26.0	-0.8	July 5	0.149	135	164	20.4	+1.6
6	0.994	9	22	28.6	0.9	10	0.258	119	169	31.3	1.0
11	0.979	17	6	32.9	0.9	15	0.390	103	174	42.3	+0.5
16	0.948	26	357	39.5	0.9	20	0.544	85	179	53.6	-0.1
21	0.889	39	350	48.8	0.9	25	0.711	65	185	63.7	0.6
26	0.784	55	345	60.1	-0.8	30	0.861	44	193	68.6	-1.2
31	0.615	77	340	67.8	-0.5	Aug. 4	0.961	23	205	65.3	1.5
Feb. 5	0.387	103	335	60.3	+0.1	9	0.997	6	253	56.3	1.6
10	0.160	133	328	32.3	1.1	14	0.987	13	357	46.6	1.3
15	0.024	162	303	5.3	2.4	19	0.955	24	12	39.0	0.9
20	0.027	161	193	5.7	+2.4	24	0.915	34	18	33.8	-0.6
25	0.130	138	173	21.5	1.5	29	0.872	42	21	30.7	0.3
Mar. 2	0.262	118	167	32.1	1.0	Sept. 3	0.828	49	24	29.0	-0.1
7	0.382	104	163	35.1	0.7	8	0.781	56	25	28.6	0.0
12	0.482	92	160	34.5	0.5	13	0.729	63	26	29.2	+0.2
17	0.564	83	158	32.9	+0.4	18	0.668	70	27	30.9	+0.2
22	0.632	75	155	31.6	0.3	23	0.595	79	27	33.3	0.3
27	0.693	67	153	31.0	+0.2	28	0.501	90	28	36.1	0.4
Apr. 1	0.749	60	151	31.5	0.0	Oct. 3	0.382	104	29	37.2	0.6
6	0.804	53	150	33.2	-0.2	8	0.235	122	30	32.2	1.0
11	0.859	44	149	36.5	-0.4	13	0.083	146	35	15.7	+1.8
16	0.915	34	148	41.9	0.8	18	0.002	175	92	0.4	3.0
21	0.966	21	148	49.6	1.2	23	0.080	147	204	17.7	1.6
26	0.998	6	141	59.0	1.7	28	0.296	114	208	50.8	+0.4
May 1	0.986	14	339	66.9	1.7	Nov. 2	0.535	86	208	63.4	-0.2
6	0.912	34	339	68.5	-1.3	7	0.720	64	208	57.8	-0.6
11	0.787	55	342	62.8	0.8	12	0.840	47	207	47.4	0.7
16	0.645	73	346	53.8	-0.3	17	0.912	35	204	38.6	0.7
21	0.510	89	350	45.1	+0.2	22	0.954	25	201	32.3	0.7
26	0.389	103	354	37.5	0.6	27	0.979	17	196	28.1	0.7
31	0.281	116	357	30.4	+1.0	Dec. 2	0.993	10	187	25.7	-0.7
June 5	0.185	129	0	22.9	1.4	7	0.999	4	164	24.5	0.8
10	0.102	143	5	14.4	1.9	12	0.999	3	58	24.4	0.8
15	0.039	157	14	6.1	2.5	17	0.994	9	25	25.4	0.7
20	0.007	170	53	1.2	3.1	22	0.982	15	14	27.7	0.7
25	0.016	165	137	2.7	+2.9	27	0.960	23	7	31.6	-0.7
30	0.066	150	157	10.2	+2.2	32	0.923	32	0	37.6	-0.7

NOTATION

- h* = the ratio of the area of the illuminated portion of the apparent disc to the area of the entire apparent disc regarded as circular.
- i* = the angle between the Sun and Earth, as seen from the planet.
- θ = the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.
- L* = the brilliancy of the disc. The unit of *L* is the amount of light received by an eye from a circular disc with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disc of the planet is illuminated.

ILLUMINATED DISC OF VENUS

Date	k	i	θ	L	Stellar Mag.	Date	k	i	θ	L	Stellar Mag.
Jan. 1	0.085	14.1	357.5	46.9	-3.4	July 5	0.467	93.8	19.2	141.5	-4.0
6	0.081	15.8	355.0	47.3	3.4	10	0.437	97.3	20.5	149.8	4.0
11	0.077	17.4	352.6	47.6	3.4	15	0.405	101.0	21.7	158.1	4.0
16	0.073	19.1	350.4	48.1	3.4	20	0.371	105.0	22.9	166.2	4.1
21	0.068	20.7	348.3	48.6	3.4	25	0.334	109.3	24.1	173.2	4.2
26	0.062	22.4	346.4	49.2	-3.4	30	0.296	114.1	25.4	178.3	-4.2
31	0.057	24.0	344.6	49.8	3.4	Aug. 4	0.255	119.3	26.9	179.9	4.2
Feb. 5	0.050	25.7	343.1	50.5	3.3	9	0.213	125.1	28.7	175.8	4.2
10	0.044	27.4	341.8	51.2	3.3	14	0.168	131.6	31.1	163.2	4.1
15	0.037	29.2	340.7	52.1	3.3	19	0.123	138.9	34.6	139.9	4.0
20	0.029	31.0	339.8	52.9	-3.3	24	0.081	146.8	39.8	106.3	-3.9
25	0.021	32.8	339.2	53.9	3.4	29	0.046	155.3	49.0	67.1	3.7
Mar. 2	0.012	34.6	338.8	54.9	3.4	Sept. 3	0.021	163.4	67.7	33.2	3.4
7	0.002	36.4	338.6	56.1	3.4	8	0.011	167.9	108.8	18.4	3.2
12	0.893	38.3	338.8	57.3	3.4	13	0.019	164.3	152.9	30.3	3.4
17	0.882	40.2	339.0	58.6	-3.4	18	0.042	156.4	173.8	64.0	-3.6
22	0.871	42.1	339.6	60.0	3.4	23	0.077	147.8	183.6	106.4	3.9
27	0.859	44.1	340.4	61.5	3.4	28	0.119	139.6	189.2	144.8	4.1
Apr. 1	0.847	46.1	341.4	63.2	3.4	Oct. 3	0.164	132.2	192.9	173.0	4.2
6	0.834	48.2	342.7	64.9	3.4	8	0.209	125.5	195.6	189.6	4.3
11	0.820	50.3	344.2	66.8	-3.4	13	0.253	119.6	197.7	196.6	-4.3
16	0.805	52.4	345.9	68.9	3.5	18	0.295	114.2	199.4	196.7	4.3
21	0.790	54.6	347.8	71.1	3.5	23	0.334	109.4	200.9	192.3	4.3
26	0.774	56.8	349.9	73.5	3.5	28	0.370	105.1	202.1	185.3	4.2
May 1	0.757	59.0	352.1	76.2	3.5	Nov. 2	0.404	101.1	203.0	177.0	4.2
6	0.740	61.3	354.5	79.0	-3.5	7	0.436	97.4	203.7	168.2	-4.2
11	0.722	63.6	356.9	82.1	3.6	12	0.466	93.9	204.2	159.3	4.1
16	0.703	66.0	359.4	85.4	3.6	17	0.494	90.7	204.5	150.6	4.1
21	0.684	68.4	1.8	89.1	3.6	22	0.520	87.7	204.5	142.4	4.0
26	0.664	70.9	4.2	93.2	3.6	27	0.546	84.8	204.3	134.7	4.0
31	0.642	73.5	6.6	97.5	-3.7	Dec. 2	0.569	82.0	203.8	127.5	-3.9
June 5	0.620	76.1	8.8	102.4	3.7	7	0.592	79.4	203.1	120.8	3.9
10	0.597	78.8	10.9	107.6	3.8	12	0.614	76.8	202.1	114.7	3.8
15	0.574	81.5	12.8	113.4	3.8	17	0.635	74.4	200.9	109.0	3.8
20	0.549	84.4	14.7	119.6	3.8	22	0.655	72.0	199.4	103.8	3.8
25	0.523	87.4	16.3	126.5	-3.9	27	0.674	69.7	197.7	98.9	-3.7
30	0.495	90.5	17.8	133.7	-3.9	32	0.691	67.5	195.8	94.4	-3.7

NOTATION

k = the ratio of the area of the illuminated portion of the apparent disc to the area of the entire apparent disc regarded as circular.

i = the angle between the Sun and Earth, as seen from the planet.

θ = the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L = the brilliancy of the disc. The unit of L is the amount of light received by an eye from a circular disc with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disc of the planet is illuminated.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS

Date	Light Time	Stellar Magnitude	P	$A_{\oplus}+180^{\circ}$	D_{\oplus}	$A_{\odot}-A_{\oplus}$	D_{\odot}	\odot_s
Jan. 1	^m 11.18	+1.0	29.63	282.60	+22.42	-39.14	+21.70	65.47
3	11.02	1.0	29.95	283.53	22.29	39.14	21.86	66.35
5	10.85	0.9	30.26	284.43	22.16	39.12	22.01	67.22
7	10.68	0.9	30.56	285.32	22.03	39.07	22.15	68.09
9	10.52	0.9	30.84	286.18	21.90	39.01	22.29	68.96
11	10.35	+0.8	31.12	287.02	+21.76	-38.92	+22.43	69.84
13	10.18	0.8	31.38	287.84	21.62	38.80	22.56	70.71
15	10.02	0.8	31.62	288.64	21.48	38.66	22.68	71.59
17	9.85	0.7	31.86	289.41	21.34	38.49	22.80	72.46
19	9.69	0.7	32.08	290.16	21.20	38.30	22.92	73.33
21	9.52	+0.6	32.29	290.88	+21.05	-38.08	+23.02	74.21
23	9.36	0.6	32.48	291.58	20.91	37.83	23.12	75.08
25	9.20	0.5	32.67	292.24	20.77	37.56	23.22	75.96
27	9.04	0.5	32.84	292.88	20.63	37.25	23.31	76.83
29	8.87	0.5	33.01	293.50	20.50	36.91	23.40	77.71
31	8.71	+0.4	33.16	294.07	+20.36	-36.54	+23.48	78.58
Feb. 2	8.55	0.4	33.30	294.62	20.24	36.13	23.55	79.46
4	8.40	0.3	33.43	295.13	20.11	35.69	23.62	80.34
6	8.24	0.3	33.54	295.61	19.99	35.21	23.68	81.22
8	8.09	0.2	33.65	296.05	19.88	34.69	23.74	82.10
10	7.93	+0.2	33.74	296.45	+19.77	-34.13	+23.79	82.98
12	7.78	0.1	33.83	296.82	19.67	33.54	23.84	83.86
14	7.64	+0.1	33.90	297.14	19.58	32.90	23.88	84.74
16	7.49	0.0	33.97	297.43	19.50	32.22	23.91	85.62
18	7.34	0.0	34.02	297.67	19.43	31.50	23.94	86.50
20	7.20	-0.1	34.06	297.87	+19.36	-30.73	+23.96	87.39
22	7.07	0.1	34.10	298.02	19.31	29.91	23.97	88.27
24	6.93	0.2	34.12	298.13	19.26	29.05	23.98	89.16
26	6.80	0.2	34.13	298.18	19.23	28.14	23.98	90.04
28	6.67	0.3	34.13	298.19	19.21	27.18	23.98	90.93
Mar. 2	6.54	-0.4	34.12	298.15	+19.21	-26.16	+23.97	91.82
4	6.42	0.4	34.10	298.06	19.21	25.09	23.95	92.71
6	6.31	0.5	34.07	297.91	19.23	23.97	23.93	93.60
8	6.20	0.5	34.02	297.71	19.27	22.80	23.90	94.50
10	6.09	0.6	33.96	297.46	19.32	21.56	23.87	95.39
12	5.98	-0.6	33.90	297.16	+19.37	-20.28	+23.83	96.29
14	5.89	0.7	33.81	296.80	19.45	18.95	23.78	97.18
16	5.79	0.8	33.72	296.39	19.54	17.56	23.73	98.08
18	5.71	0.8	33.60	295.93	19.64	16.12	23.67	98.98
20	5.63	0.9	33.48	295.42	19.75	14.63	23.60	99.88
22	5.55	-0.9	33.34	294.87	+19.88	-13.09	+23.53	100.78
24	5.48	1.0	33.19	294.27	20.01	11.51	23.46	101.69
26	5.42	1.0	33.03	293.63	20.16	9.88	23.37	102.60
28	5.36	1.0	32.85	292.95	20.31	8.22	23.28	103.50
30	5.31	1.1	32.65	292.23	20.47	6.52	23.18	104.41
Apr. 1	5.27	-1.1	32.45	291.49	+20.64	-4.79	+23.08	105.32
3	5.23	-1.2	32.23	290.72	+20.82	-3.04	+22.97	106.24

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS

Date	λ	Dia- meter	i	q	Q	Central Meridian		G.M.T. of Transit of Zero Meridian	
						Of Date	Of Inter- mediate Date	Of Date	Of Inter- mediate Date
Jan. 1	0.904	6.96	36.18	0.67	293.11	263.20	253.65	^h 6 ^m 37.7	^h 7 ^m 17.0
3	0.904	7.06	36.17	0.68	293.00	244.11	234.56	7 56.2	8 35.4
5	0.904	7.17	36.14	0.69	292.89	225.02	215.49	9 14.6	9 53.7
7	0.904	7.28	36.10	0.70	292.77	205.96	196.44	10 32.9	11 12.0
9	0.904	7.40	36.04	0.71	292.65	186.93	177.42	11 51.1	12 30.2
11	0.905	7.51	35.96	0.72	292.52	167.91	158.41	13 09.2	13 48.2
13	0.905	7.64	35.86	0.72	292.39	148.91	139.42	14 27.2	15 06.2
15	0.906	7.76	35.74	0.73	292.26	129.94	120.46	15 45.1	16 24.0
17	0.906	7.89	35.60	0.74	292.12	110.99	101.53	17 02.9	17 41.8
19	0.907	8.03	35.44	0.74	291.98	92.07	82.62	18 20.6	18 59.4
21	0.908	8.17	35.26	0.75	291.83	73.17	63.73	19 38.2	20 16.9
23	0.909	8.31	35.05	0.75	291.68	54.30	44.88	20 55.7	21 34.3
25	0.910	8.46	34.81	0.76	291.53	35.46	26.04	22 13.0	22 51.6
27	0.912	8.61	34.55	0.76	291.38	16.64	7.24	23 30.3	...
29	0.913	8.76	34.27	0.76	291.22	357.85	348.47	0 08.8	0 47.3
31	0.915	8.92	33.95	0.76	291.06	339.10	329.73	1 25.8	2 04.3
Feb. 2	0.916	9.09	33.60	0.76	290.90	320.37	311.02	2 42.7	3 21.1
4	0.918	9.26	33.22	0.76	290.73	301.68	292.35	3 59.5	4 37.8
6	0.920	9.44	32.81	0.75	290.57	283.03	273.72	5 16.1	5 54.3
8	0.922	9.62	32.36	0.75	290.40	264.41	255.11	6 32.5	7 10.7
10	0.925	9.80	31.88	0.74	290.23	245.83	236.55	7 48.8	8 26.8
12	0.927	9.99	31.35	0.73	290.06	227.28	218.03	9 04.9	9 42.9
14	0.930	10.19	30.79	0.72	289.89	208.78	199.54	10 20.8	10 58.7
16	0.932	10.39	30.19	0.71	289.71	190.31	181.10	11 36.6	12 14.4
18	0.935	10.59	29.55	0.69	289.53	171.89	162.70	12 52.2	13 29.9
20	0.938	10.80	28.87	0.67	289.35	153.51	144.34	14 07.6	14 45.2
22	0.941	11.01	28.14	0.65	289.16	135.18	126.02	15 22.7	16 00.3
24	0.944	11.22	27.36	0.63	288.97	116.89	107.76	16 37.8	17 15.2
26	0.947	11.44	26.54	0.60	288.77	98.64	89.54	17 52.5	18 29.9
28	0.951	11.66	25.67	0.58	288.56	80.45	71.37	19 07.1	19 44.3
Mar. 2	0.954	11.88	24.75	0.55	288.34	62.31	53.26	20 21.5	20 58.6
4	0.958	12.11	23.77	0.51	288.12	44.22	35.19	21 35.6	22 12.6
6	0.961	12.33	22.75	0.48	287.87	26.17	17.17	22 49.5	23 26.4
8	0.965	12.56	21.67	0.44	287.60	8.18	359.21	...	0 03.2
10	0.968	12.78	20.54	0.41	287.31	350.25	341.30	0 40.0	1 16.7
12	0.972	13.00	19.36	0.37	286.98	332.36	323.44	1 53.4	2 30.0
14	0.975	13.21	18.12	0.33	286.61	314.53	305.63	3 06.5	3 42.9
16	0.979	13.42	16.84	0.29	286.17	296.74	287.87	4 19.4	4 55.8
18	0.982	13.63	15.50	0.25	285.65	279.00	270.16	5 32.2	6 08.4
20	0.985	13.83	14.12	0.21	285.03	261.32	252.49	6 44.7	7 20.8
22	0.988	14.01	12.69	0.17	284.26	243.67	234.87	7 57.0	8 33.1
24	0.990	14.19	11.23	0.14	283.26	226.08	217.29	9 09.1	9 45.1
26	0.993	14.35	9.72	0.10	281.95	208.52	199.75	10 21.1	10 57.0
28	0.995	14.50	8.19	0.07	280.11	190.99	182.24	11 32.9	12 08.7
30	0.997	14.64	6.63	0.05	277.37	173.50	164.77	12 44.5	13 20.3
Apr. 1	0.998	14.76	5.07	0.03	272.87	156.04	147.32	13 56.1	14 31.8
3	0.999	14.86	3.55	0.01	264.33	138.60	129.89	15 07.5	15 43.3

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS

Date	Light Time	Stellar Magni- tude	P	$A_{\odot}+180^{\circ}$	D_{\odot}	$A_{\odot}-A_{\oplus}$	D_{\odot}	\odot_{\oplus}
Apr. 1	^m 5·27	-1·1	^o 32·45	^o 291·49	^o +20·64	^o - 4·79	^o +23·08	^o 105·32
3	5·23	1·2	32·23	290·72	20·82	3·04	22·97	106·24
5	5·21	1·2	32·00	289·93	20·99	- 1·27	22·85	107·15
7	5·18	1·2	31·76	289·14	21·17	+ 0·52	22·73	108·07
9	5·17	1·2	31·52	288·33	21·35	2·31	22·60	108·99
11	5·16	-1·2	31·27	287·52	+21·53	+ 4·10	+22·47	109·91
13	5·16	1·2	31·02	286·73	21·71	5·88	22·33	110·83
15	5·17	1·2	30·76	285·94	21·89	7·66	22·18	111·76
17	5·18	1·1	30·51	285·18	22·07	9·41	22·02	112·69
19	5·20	1·1	30·26	284·43	22·24	11·14	21·86	113·62
21	5·22	-1·1	30·02	283·72	+22·40	+12·84	+21·70	114·55
23	5·26	1·1	29·78	283·04	22·56	14·50	21·53	115·48
25	5·29	1·0	29·56	282·41	22·72	16·13	21·35	116·42
27	5·34	1·0	29·35	281·81	22·86	17·71	21·16	117·36
29	5·39	1·0	29·15	281·26	23·01	19·24	20·97	118·30
May 1	5·44	-0·9	28·97	280·76	+23·14	+20·73	+20·77	119·24
3	5·50	0·9	28·80	280·32	23·27	22·16	20·57	120·18
5	5·56	0·8	28·66	279·93	23·40	23·54	20·36	121·13
7	5·63	0·8	28·53	279·59	23·51	24·86	20·14	122·08
9	5·70	0·7	28·43	279·32	23·62	26·13	19·92	123·04
11	5·78	-0·7	28·35	279·10	+23·73	+27·33	+19·69	123·99
13	5·86	0·7	28·29	278·94	23·83	28·48	19·46	124·95
15	5·94	0·6	28·25	278·84	23·92	29·57	19·22	125·91
17	6·03	0·6	28·23	278·79	24·01	30·60	18·97	126·88
19	6·12	0·5	28·24	278·80	24·09	31·58	18·72	127·84
21	6·21	-0·5	28·26	278·86	+24·16	+32·50	+18·46	128·81
23	6·31	0·4	28·31	278·98	24·23	33·36	18·20	129·78
25	6·40	0·4	28·38	279·15	24·29	34·18	17·93	130·76
27	6·50	0·4	28·46	279·38	24·35	34·94	17·66	131·74
29	6·60	0·3	28·57	279·65	24·40	35·66	17·38	132·72
31	6·70	-0·3	28·69	279·97	+24·44	+36·32	+17·09	133·70
June 2	6·81	0·2	28·83	280·34	24·48	36·94	16·80	134·69
4	6·91	0·2	28·99	280·76	24·51	37·51	16·50	135·68
6	7·02	0·2	29·16	281·21	24·53	38·03	16·19	136·67
8	7·12	0·1	29·35	281·71	24·54	38·52	15·88	137·67
10	7·23	-0·1	29·55	282·25	+24·55	+38·96	+15·57	138·67
12	7·34	0·0	29·76	282·84	24·55	39·37	15·25	139·67
14	7·45	0·0	29·98	283·45	24·54	39·73	14·92	140·68
16	7·56	0·0	30·22	284·11	24·52	40·06	14·60	141·69
18	7·67	+0·1	30·46	284·80	24·50	40·36	14·26	142·70
20	7·78	+0·1	30·71	285·52	+24·46	+40·63	+13·92	143·72
22	7·89	0·1	30·96	286·27	24·42	40·87	13·57	144·73
24	8·00	0·2	31·23	287·05	24·37	41·07	13·22	145·76
26	8·11	0·2	31·50	287·86	24·31	41·25	12·86	146·78
28	8·22	0·2	31·77	288·69	24·24	41·40	12·50	147·81
30	8·34	+0·2	32·04	289·56	+24·15	+41·52	+12·14	148·84
July 2	8·45	+0·3	32·32	290·45	+24·06	+41·63	+11·77	149·88

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS

Date	h	Dia- meter	i	q	Q	Central Meridian		G.M.T. of Transit of Zero Meridian	
						Of Date	Of Inter- mediate Date	Of Date	Of Inter- mediate Date
						[°]	[°]	^h ^m	^h ^m
Apr. 1	0.998	14.76	5.07	0.03	272.87	156.04	147.32	13 56.1	14 31.8
3	0.999	14.86	3.55	0.01	264.33	138.60	129.89	15 07.5	15 43.3
5	1.000	14.94	2.20	0.00	244.06	121.18	112.47	16 19.0	16 54.6
7	1.000	15.00	1.63	0.00	194.73	103.77	95.06	17 30.3	18 06.0
9	1.000	15.05	2.48	0.01	152.21	86.36	77.66	18 41.7	19 17.4
11	0.999	15.07	3.91	0.02	135.82	68.95	60.24	19 53.0	20 28.7
13	0.998	15.07	5.49	0.03	128.51	51.54	42.82	21 04.4	21 40.2
15	0.996	15.05	7.10	0.06	124.51	34.10	25.38	22 16.0	22 51.7
17	0.994	15.02	8.72	0.09	122.01	16.65	7.91	23 27.6	...
19	0.992	14.96	10.33	0.12	120.31	359.17	350.42	0 03.4	0 39.3
21	0.989	14.89	11.92	0.16	119.07	341.66	332.89	1 15.2	1 51.1
23	0.986	14.80	13.48	0.20	118.14	324.11	315.32	2 27.1	3 03.2
25	0.983	14.69	15.00	0.25	117.41	306.53	297.72	3 39.3	4 15.4
27	0.979	14.57	16.50	0.30	116.82	288.90	280.06	4 51.6	5 27.8
29	0.976	14.44	17.95	0.35	116.34	271.22	262.36	6 04.1	6 40.4
May 1	0.972	14.30	19.36	0.40	115.94	253.49	244.60	7 16.8	7 53.3
3	0.968	14.14	20.72	0.46	115.59	235.70	226.79	8 29.8	9 06.4
5	0.964	13.98	22.03	0.51	115.30	217.86	208.92	9 43.0	10 19.7
7	0.959	13.81	23.30	0.56	115.04	199.96	190.99	10 56.5	11 33.3
9	0.955	13.63	24.51	0.61	114.82	182.01	173.00	12 10.2	12 47.2
11	0.951	13.45	25.67	0.66	114.63	163.99	154.96	13 24.2	14 01.3
13	0.946	13.27	26.78	0.71	114.46	145.92	136.86	14 38.4	15 15.6
15	0.942	13.08	27.84	0.76	114.31	127.78	118.69	15 52.9	16 30.3
17	0.938	12.90	28.85	0.80	114.17	109.59	100.47	17 07.7	17 45.1
19	0.934	12.71	29.82	0.84	114.05	91.34	82.20	18 22.6	19 00.2
21	0.930	12.52	30.73	0.88	113.94	73.04	63.87	19 37.8	20 15.5
23	0.926	12.33	31.60	0.91	113.84	54.68	45.48	20 53.3	21 31.1
25	0.922	12.15	32.43	0.95	113.76	36.27	27.04	22 09.0	22 46.9
27	0.918	11.96	33.21	0.98	113.67	17.81	8.56	23 24.9	...
29	0.915	11.78	33.95	1.00	113.60	359.30	350.02	0 02.9	0 41.0
31	0.911	11.60	34.64	1.03	113.53	340.73	331.43	1 19.1	1 57.3
June 2	0.908	11.43	35.30	1.05	113.46	322.12	312.80	2 35.5	3 13.8
4	0.905	11.25	35.91	1.07	113.40	303.47	294.12	3 52.2	4 30.6
6	0.902	11.08	36.49	1.09	113.34	284.77	275.40	5 09.0	5 47.5
8	0.899	10.92	37.04	1.10	113.28	266.02	256.64	6 26.0	7 04.5
10	0.896	10.75	37.55	1.11	113.23	247.24	237.83	7 43.1	8 21.8
12	0.894	10.59	38.03	1.12	113.18	228.41	218.99	9 00.5	9 39.2
14	0.892	10.44	38.47	1.13	113.12	209.55	200.11	10 18.0	10 56.8
16	0.889	10.29	38.89	1.14	113.06	190.66	181.20	11 35.6	12 14.5
18	0.887	10.14	39.27	1.14	113.01	171.73	162.25	12 53.4	13 32.4
20	0.885	10.00	39.64	1.15	112.95	152.77	143.27	14 11.4	14 50.4
22	0.883	9.86	39.97	1.15	112.89	133.77	124.26	15 29.5	16 08.6
24	0.882	9.72	40.28	1.15	112.83	114.75	105.22	16 47.7	17 26.8
26	0.880	9.58	40.57	1.15	112.76	95.70	86.16	18 06.0	18 45.2
28	0.878	9.46	40.83	1.15	112.69	76.61	67.06	19 24.4	20 03.7
30	0.877	9.33	41.07	1.15	112.61	57.51	47.94	20 43.0	21 22.3
July 2	0.876	9.21	41.29	1.15	112.53	38.38	28.80	22 01.6	22 41.0

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS

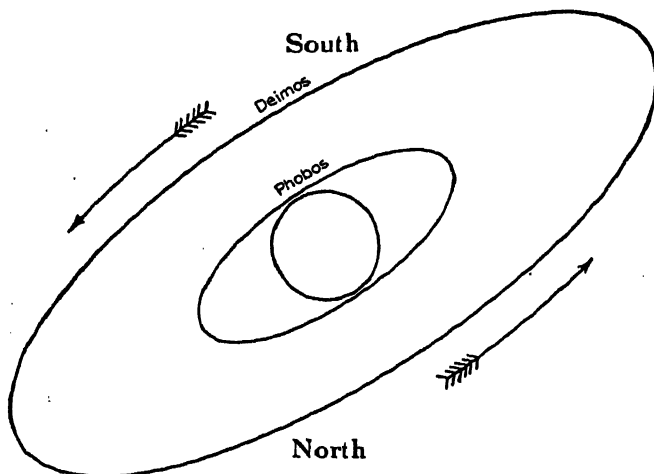
Date	Light Time	Stellar Magnitude	P	$A_{\odot} + 180^{\circ}$	D_{\odot}	$A_{\odot} - A_{\oplus}$	D_{\oplus}	\odot_{δ}
July 2	^m 8.45	+0.3	^o 32.32	290.45	+24.06	+41.63	+11.77	149.88
4	8.56	0.3	32.59	291.36	23.96	41.70	11.39	150.92
6	8.67	0.3	32.87	292.30	23.85	41.76	11.01	151.96
8	8.78	0.4	33.15	293.25	23.73	41.79	10.63	153.01
10	8.89	0.4	33.42	294.23	23.59	41.81	10.24	154.06
12	9.00	+0.4	33.69	295.23	+23.44	+41.80	+ 9.85	155.12
14	9.11	0.4	33.96	296.24	23.29	41.78	9.45	156.17
16	9.22	0.4	34.22	297.27	23.12	41.75	9.05	157.23
18	9.33	0.5	34.47	298.32	22.94	41.70	8.64	158.30
20	9.43	0.5	34.72	299.38	22.75	41.63	8.23	159.37
22	9.54	+0.5	34.96	300.46	+22.54	+41.55	+ 7.82	160.44
24	9.65	0.5	35.20	301.55	22.33	41.46	7.40	161.52
26	9.75	0.6	35.42	302.66	22.10	41.36	6.98	162.60
28	9.86	0.6	35.63	303.78	21.86	41.25	6.56	163.68
30	9.96	0.6	35.84	304.91	21.61	41.12	6.13	164.77
Aug. 1	10.07	+0.6	36.03	306.05	+21.35	+40.99	+ 5.70	165.86
3	10.17	0.6	36.21	307.20	21.07	40.85	5.26	166.95
5	10.27	0.6	36.37	308.36	20.79	40.70	4.83	168.05
7	10.38	0.7	36.52	309.53	20.49	40.54	4.38	169.16
9	10.48	0.7	36.66	310.71	20.18	40.38	3.94	170.26
11	10.58	+0.7	36.78	311.89	+19.85	+40.21	+ 3.50	171.37
13	10.68	0.7	36.89	313.09	19.52	40.04	3.05	172.49
15	10.78	0.7	36.98	314.29	19.17	39.86	2.60	173.60
17	10.88	0.8	37.05	315.50	18.81	39.68	2.14	174.73
19	10.98	0.8	37.10	316.71	18.44	39.50	1.68	175.85
21	11.07	+0.8	37.14	317.92	+18.06	+39.32	+ 1.23	176.98
23	11.17	0.8	37.16	319.15	17.66	39.13	0.77	178.11
25	11.27	0.8	37.16	320.38	17.26	38.94	+ 0.30	179.25
27	11.36	0.8	37.14	321.61	16.85	38.75	- 0.16	180.39
29	11.46	0.8	37.09	322.85	16.42	38.56	0.62	181.54
31	11.55	+0.8	37.03	324.09	+15.98	+38.36	- 1.09	182.68
Sept. 2	11.64	0.9	36.95	325.34	15.53	38.17	1.56	183.84
4	11.74	0.9	36.84	326.58	15.07	37.98	2.03	184.99
6	11.83	0.9	36.72	327.84	14.60	37.79	2.50	186.15
8	11.92	0.9	36.57	329.09	14.12	37.60	2.97	187.31
10	12.01	+0.9	36.40	330.35	+13.64	+37.40	- 3.44	188.48
12	12.10	0.9	36.21	331.62	13.14	37.22	3.91	189.65
14	12.19	0.9	36.00	332.88	12.63	37.03	4.38	190.82
16	12.28	0.9	35.76	334.14	12.11	36.85	4.85	192.00
18	12.37	0.9	35.50	335.41	11.59	36.66	5.32	193.18
20	12.46	+0.9	35.22	336.69	+11.05	+36.49	- 5.79	194.37
22	12.54	1.0	34.91	337.96	10.51	36.31	6.26	195.55
24	12.63	1.0	34.58	339.24	9.96	36.13	6.72	196.74
26	12.72	1.0	34.23	340.52	9.40	35.96	7.19	197.94
28	12.80	1.0	33.85	341.80	8.84	35.79	7.66	199.14
30	12.88	+1.0	33.46	343.09	+ 8.26	+35.62	- 8.12	200.34
Oct. 2	12.97	+1.0	33.04	344.38	+ 7.68	+35.46	- 8.58	201.54

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS

Date	h	Dia- meter	i	q	Q	Central Meridian		G.M.T. of Transit of Zero Meridian	
						Of Date	Of Inter- mediate Date	Of Date	Of Inter- mediate Date
July	2	0.876	9.21	41.29	1.15	112.53	38.38	28.80	22 01.6
	4	0.875	9.09	41.49	1.14	112.45	19.22	9.63	23 59.8
	6	0.874	8.97	41.67	1.14	112.36	0.04	350.44	0 39.3
	8	0.872	8.86	41.84	1.13	112.26	340.84	331.23	1 58.2
	10	0.872	8.75	41.98	1.12	112.16	321.62	312.00	2 37.7
	12	0.871	8.64	42.11	1.12	112.05	302.38	292.76	3 56.8
	14	0.870	8.54	42.22	1.11	111.94	283.12	273.49	5 16.0
	16	0.870	8.44	42.32	1.10	111.81	263.85	254.21	6 35.2
	18	0.869	8.34	42.40	1.09	111.68	244.56	234.91	7 54.5
	20	0.869	8.24	42.48	1.08	111.54	225.25	215.60	9 13.9
	22	0.868	8.15	42.53	1.07	111.40	205.93	196.27	10 33.3
	24	0.868	8.06	42.58	1.06	111.24	186.60	176.93	11 52.7
	26	0.868	7.97	42.61	1.05	111.08	167.25	157.58	13 12.3
	28	0.868	7.89	42.63	1.04	110.91	147.89	138.21	14 31.9
	30	0.868	7.81	42.64	1.03	110.72	128.52	118.83	15 51.5
Aug.	1	0.868	7.72	42.63	1.02	110.53	109.14	99.44	17 11.2
	3	0.868	7.65	42.62	1.01	110.33	89.75	80.05	18 31.0
	5	0.868	7.57	42.60	1.00	110.12	70.34	60.64	19 50.7
	7	0.868	7.50	42.56	0.99	109.89	50.94	41.23	21 10.5
	9	0.868	7.42	42.52	0.98	109.66	31.52	21.80	22 30.3
	11	0.869	7.35	42.47	0.96	109.42	12.09	2.37	23 50.2
	13	0.869	7.28	42.41	0.95	109.16	352.66	342.94	0 30.2
	15	0.870	7.22	42.34	0.94	108.90	333.22	323.49	1 50.1
	17	0.870	7.15	42.27	0.93	108.62	313.77	304.04	3 10.1
	19	0.870	7.09	42.19	0.92	108.33	294.32	284.59	4 30.0
	21	0.871	7.02	42.10	0.91	108.04	274.86	265.13	5 50.0
	23	0.872	6.96	42.00	0.89	107.73	255.40	245.66	7 10.0
	25	0.872	6.90	41.90	0.88	107.40	235.93	226.19	8 30.1
	27	0.873	6.84	41.79	0.87	107.07	216.46	206.72	9 50.1
	29	0.874	6.79	41.67	0.86	106.72	196.98	187.24	11 10.2
Sept.	31	0.874	6.73	41.55	0.85	106.36	177.50	167.76	12 30.3
	2	0.875	6.68	41.42	0.84	105.99	158.01	148.27	13 50.4
	4	0.876	6.63	41.28	0.82	105.61	138.53	128.78	15 10.5
	6	0.877	6.58	41.14	0.81	105.21	119.04	109.29	16 30.7
	8	0.877	6.53	41.00	0.80	104.81	99.54	89.79	17 50.8
	10	0.878	6.48	40.85	0.79	104.39	80.04	70.29	19 11.0
	12	0.879	6.43	40.69	0.78	103.96	60.54	50.79	20 31.1
	14	0.880	6.38	40.53	0.76	103.52	41.04	31.29	21 51.3
	16	0.881	6.33	40.37	0.75	103.06	21.54	11.78	23 11.5
	18	0.882	6.29	40.20	0.74	102.60	2.03	352.28	0 31.8
	20	0.883	6.25	40.03	0.73	102.12	342.52	332.76	1 11.9
	22	0.884	6.20	39.85	0.72	101.63	323.01	313.25	2 32.1
	24	0.885	6.16	39.67	0.71	101.13	303.49	293.74	3 52.3
	26	0.886	6.12	39.48	0.70	100.62	283.98	274.22	5 12.6
	28	0.887	6.08	39.29	0.69	100.09	264.46	254.70	6 32.8
Oct.	30	0.888	6.04	39.10	0.68	99.56	244.94	235.17	7 53.1
	2	0.889	6.00	38.90	0.67	99.02	225.41	215.65	9 13.4

SATELLITES OF MARS, 1935

APPARENT ORBITS OF THE SATELLITES OF MARS AT DATE
OF OPPOSITION, APRIL 6, AS SEEN IN AN INVERTING
TELESCOPE



Sidereal period of Phobos, $7^h 39^m 13^s.85$

Sidereal period of Deimos, $30^h 17^m 54^s.87$

DEIMOS

GREENWICH MEAN TIME OF GREATEST EASTERN ELONGATION

Feb.	d	h	Mar.	d	h	Mar.	d	h	Apr.	d	h	May	d	h
25	13.8		13	23.6		30	09.0		15	18.4		2	03.8	
26	20.1		15	05.8		31	15.3		17	00.6		3	10.1	
28	02.4		16	12.1		1	21.6		18	06.9		4	16.4	
Mar. 1	08.7		17	18.4		3	03.8		19	13.2		5	22.7	
2	15.0		19	00.7		4	10.1		20	19.4		7	05.0	
3	21.3		20	06.9		5	16.3		22	01.7		8	11.2	
5	03.6		21	13.2		6	22.6		23	08.0		9	17.5	
6	09.9		22	19.5		8	04.8		24	14.2		10	23.8	
7	16.2		24	01.7		9	11.1		25	20.5		12	06.1	
8	22.4		25	08.0		10	17.4		27	02.8		13	12.4	
10	04.7		26	14.3		11	23.6		28	09.0		14	18.7	
11	11.0		27	20.5		13	05.9		29	15.3		16	01.0	
12	17.3		29	02.8		14	12.1		30	21.6		17	07.3	

SATELLITES OF MARS, 1935

587

PHOBOS

Time from Eastern Elongation	p^1	F	Time from Eastern Elongation	p^1	F	Time from Eastern Elongation	p^1	F	Time from Eastern Elongation	p^1	F
h m	°		h m	°		h m	°		h m	°	
0 00	123.0	1.000	2 00	223.5	0.391	4 00	306.2	0.992	6 00	62.3	0.432
0 10	126.0	0.992	2 10	241.7	0.430	4 10	309.3	0.967	6 10	76.5	0.499
0 20	129.2	0.968	2 20	256.0	0.496	4 20	312.6	0.928	6 20	87.0	0.579
0 30	132.5	0.930	2 30	266.6	0.575	4 30	316.4	0.875	6 30	94.8	0.663
0 40	136.2	0.877	2 40	274.6	0.659	4 40	320.6	0.809	6 40	101.0	0.744
0 50	140.4	0.812	2 50	280.7	0.741	4 50	325.7	0.734	6 50	105.9	0.818
1 00	145.5	0.737	3 00	285.7	0.815	5 00	332.0	0.653	7 00	110.1	0.882
1 10	151.7	0.656	3 10	289.9	0.879	5 10	340.1	0.569	7 10	113.8	0.933
1 20	159.8	0.572	3 20	293.6	0.932	5 20	351.0	0.490	7 20	117.1	0.971
1 30	170.5	0.493	3 30	297.0	0.970	5 30	5.6	0.426	7 30	120.2	0.993
1 40	184.9	0.428	3 40	300.1	0.993	5 40	24.1	0.389	7 40	123.2	1.000
1 50	203.3	0.390	3 50	303.1	1.000	5 50	44.2	0.392			

Date	$P - P_0$	$\frac{a(\Delta)}{\Delta}$	Date	$P - P_0$	$\frac{a(\Delta)}{\Delta}$	Date	$P - P_0$	$\frac{a(\Delta)}{\Delta}$	Date	$P - P_0$	$\frac{a(\Delta)}{\Delta}$
Feb. 24	+2.5	15.5	Mar. 17	+2.1	18.7	Apr. 7	+0.2	20.7	Apr. 28	-2.3	20.1
25	2.5	15.7	18	2.1	18.8	8	+0.1	20.8	29	2.4	20.0
26	2.5	15.8	19	2.0	19.0	9	0.0	20.8	30	2.5	19.9
27	2.5	16.0	20	2.0	19.1	10	-0.2	20.8	May 1	2.6	19.8
28	2.5	16.1	21	1.9	19.2	11	0.3	20.8	2	2.7	19.7
Mar. 1	+2.5	16.3	22	+1.8	19.4	12	-0.4	20.8	3	-2.8	19.6
2	2.5	16.4	23	1.8	19.5	13	0.5	20.8	4	2.8	19.4
3	2.5	16.6	24	1.7	19.6	14	0.7	20.8	5	2.9	19.3
4	2.5	16.7	25	1.6	19.7	15	0.8	20.8	6	3.0	19.2
5	2.5	16.9	26	1.5	19.8	16	0.9	20.8	7	3.0	19.1
6	+2.5	17.0	27	+1.4	19.9	17	-1.1	20.8	8	-3.1	19.0
7	2.5	17.2	28	1.3	20.0	18	1.2	20.7	9	3.1	18.8
8	2.5	17.4	29	1.2	20.1	19	1.3	20.7	10	3.2	18.7
9	2.4	17.5	30	1.1	20.2	20	1.4	20.6	11	3.2	18.6
10	2.4	17.7	31	1.0	20.3	21	1.6	20.6	12	3.2	18.5
11	+2.4	17.8	Apr. 1	+0.9	20.4	22	-1.7	20.5	13	-3.3	18.3
12	2.4	18.0	2	0.8	20.5	23	1.8	20.5	14	3.3	18.2
13	2.3	18.1	3	0.7	20.5	24	1.9	20.4	15	3.3	18.1
14	2.3	18.3	4	0.6	20.6	25	2.0	20.3	16	3.3	18.0
15	2.2	18.4	5	0.5	20.7	26	2.1	20.2	17	3.3	17.8
16	+2.2	18.6	6	+0.3	20.7	27	-2.2	20.1	18	-3.3	17.7

Position angle of satellite $p = p^1 + (P - P_0)$

Apparent distance of satellite $s = F \frac{a(\Delta)}{\Delta}$

SATELLITES OF MARS, 1935

DEIMOS

Time from Eastern Elongation	p^1	F	Time from Eastern Elongation	p^1	F	Time from Eastern Elongation	p^1	F	Time from Eastern Elongation	p^1	F
h m	$^{\circ}$		h m	$^{\circ}$		h m	$^{\circ}$		h m	$^{\circ}$	
0 00	122.0	1.000	8 00	225.5	0.378	16 00	305.8	0.986	24 00	68.3	0.442
0 40	124.9	0.992	8 40	244.0	0.424	16 40	308.9	0.958	24 40	81.1	0.519
1 20	128.0	0.967	9 20	258.0	0.496	17 20	312.2	0.913	25 20	90.4	0.605
2 00	131.2	0.927	10 00	268.1	0.580	18 00	315.9	0.855	26 00	97.4	0.691
2 40	134.8	0.873	10 40	275.7	0.667	18 40	320.3	0.785	26 40	102.9	0.772
3 20	139.0	0.806	11 20	281.5	0.750	19 20	325.5	0.705	27 20	107.4	0.844
4 00	144.0	0.728	12 00	286.2	0.825	20 00	332.2	0.619	28 00	111.2	0.904
4 40	150.2	0.643	12 40	290.2	0.889	20 40	341.1	0.533	28 40	114.6	0.951
5 20	158.4	0.556	13 20	293.7	0.940	21 20	353.2	0.454	29 20	117.7	0.983
6 00	169.5	0.475	14 00	296.9	0.976	22 00	9.7	0.394	30 00	120.7	0.998
6 40	184.7	0.408	14 40	299.9	0.996	22 40	30.2	0.369	30 40	123.6	0.997
7 20	204.3	0.372	15 20	302.8	0.999	23 20	51.0	0.388			

Date	$P-P_0$	$\frac{a(\Delta)}{\Delta}$	Date	$P-P_0$	$\frac{a(\Delta)}{\Delta}$	Date	$P-P_0$	$\frac{a(\Delta)}{\Delta}$	Date	$P-P_0$	$\frac{a(\Delta)}{\Delta}$
Feb. 24	+2.0	38.8	Mar. 17	+1.5	46.8	Apr. 7	-0.4	51.9	Apr. 28	-3.0	50.2
25	2.0	39.2	18	1.5	47.1	8	0.6	52.0	29	3.1	50.0
26	2.0	39.6	19	1.4	47.5	9	0.7	52.0	30	3.2	49.7
27	2.0	40.0	20	1.3	47.8	10	0.8	52.1	May 1	3.3	49.5
28	2.0	40.3	21	1.3	48.2	11	1.0	52.1	2	3.4	49.2
Mar. 1	+2.0	40.7	22	+1.2	48.5	12	-1.1	52.1	3	-3.5	48.9
2	2.0	41.1	23	1.1	48.8	13	1.2	52.1	4	3.6	48.6
3	2.0	41.5	24	1.0	49.1	14	1.3	52.1	5	3.6	48.3
4	2.0	41.9	25	0.9	49.4	15	1.5	52.1	6	3.7	48.1
5	2.0	42.3	26	0.8	49.6	16	1.6	52.0	7	3.8	47.8
6	+2.0	42.6	27	+0.8	49.9	17	-1.7	51.9	8	-3.8	47.5
7	1.9	43.0	28	0.7	50.2	18	1.9	51.8	9	3.9	47.2
8	1.9	43.4	29	0.6	50.4	19	2.0	51.8	10	3.9	46.9
9	1.9	43.8	30	0.5	50.6	20	2.1	51.6	11	3.9	46.5
10	1.8	44.2	31	0.4	50.8	21	2.2	51.5	12	4.0	46.2
11	+1.8	44.6	Apr. 1	+0.3	51.0	22	-2.4	51.3	13	-4.0	45.9
12	1.8	45.0	2	+0.2	51.2	23	2.5	51.2	14	4.0	45.6
13	1.7	45.3	3	0.0	51.4	24	2.6	51.0	15	4.0	45.3
14	1.7	45.7	4	-0.1	51.6	25	2.7	50.8	16	4.1	44.9
15	1.6	46.1	5	0.2	51.7	26	2.8	50.6	17	4.1	44.6
16	+1.6	46.4	6	-0.3	51.8	27	-2.9	50.4	18	-4.1	44.3

Position angle of satellite $p = p^1 + (P - P_0)$ Apparent distance of satellite $s = F \frac{a(\Delta)}{\Delta}$

PHOBOS

GREENWICH MEAN TIME OF GREATEST EASTERN ELONGATION

Feb.	^d 24 11.8	^h	Mar.	^d 13 01.7	^h	Mar.	^d 29 15.6	^h	Apr.	^d 15 05.5	^h	May	^d 1 19.4	^h
	24 19.4			13 09.4			29 23.3			15 13.1			2 03.0	
	25 03.1			13 17.0			30 06.9			15 20.8			2 10.7	
	25 10.7			14 00.7			30 14.6			16 04.4			2 18.3	
	25 18.4			14 08.3			30 22.2			16 12.1			3 02.0	
	26 02.0			14 16.0			31 05.9			16 19.7			3 09.6	
	26 09.7			14 23.6			31 13.5			17 03.4			3 17.3	
	26 17.3			15 07.3			31 21.2			17 11.0			4 00.9	
	27 01.0			15 14.9		Apr.	1 04.8			17 18.7			4 08.6	
	27 08.6			15 22.6			1 12.5			18 02.3			4 16.2	
	27 16.3			16 06.2			1 20.1			18 10.0			4 23.9	
	27 23.9			16 13.9			2 03.8			18 17.6			5 07.5	
	28 07.6			16 21.5			2 11.4			19 01.3			5 15.2	
	28 15.2			17 05.2			2 19.1			19 08.9			5 22.9	
	28 22.9			17 12.8			3 02.7			19 16.6			6 06.5	
Mar.	1 06.6			17 20.5			3 10.4			20 00.2			6 14.2	
	1 14.2			18 04.1			3 18.0			20 07.9			6 21.8	
	1 21.9			18 11.8			4 01.7			20 15.5			7 05.5	
	2 05.5			18 19.5			4 09.3			20 23.2			7 13.1	
	2 13.2			19 03.1			4 17.0			21 06.8			7 20.8	
	2 20.8			19 10.8			5 00.6			21 14.5			8 04.4	
	3 04.5			19 18.4			5 08.3			21 22.2			8 12.1	
	3 12.1			20 02.1			5 15.9			22 05.8			8 19.7	
	3 19.8			20 09.7			5 23.6			22 13.5			9 03.4	
	4 03.4			20 17.4			6 07.2			22 21.1			9 11.0	
	4 11.1			21 01.0			6 14.9			23 04.8			9 18.7	
	4 18.7			21 08.7			6 22.5			23 12.4			10 02.3	
	5 02.4			21 16.3			7 06.2			23 20.1			10 10.0	
	5 10.0			22 00.0			7 13.8			24 03.7			10 17.6	
	5 17.7			22 07.6			7 21.5			24 11.4			11 01.3	
	6 01.4			22 15.3			8 05.1			24 19.0			11 09.0	
	6 09.0			22 22.9			8 12.8			25 02.7			11 16.6	
	6 16.7			23 06.6			8 20.4			25 10.3			12 00.3	
	7 00.3			23 14.2			9 04.1			25 18.0			12 07.9	
	7 08.0			23 21.9			9 11.7			26 01.6			12 15.6	
	7 15.6			24 05.5			9 19.4			26 09.3			12 23.2	
	7 23.3			24 13.2			10 03.0			26 16.9			13 06.9	
	8 06.9			24 20.8			10 10.7			27 00.6			13 14.5	
	8 14.6			25 04.5			10 18.4			27 08.2			13 22.2	
	8 22.2			25 12.1			11 02.0			27 15.9			14 05.8	
	9 05.9			25 19.8			11 09.7			27 23.5			14 13.5	
	9 13.5			26 03.4			11 17.3			28 07.2			14 21.1	
	9 21.2			26 11.1			12 01.0			28 14.8			15 04.8	
	10 04.8			26 18.7			12 08.6			28 22.5			15 12.4	
	10 12.5			27 02.4			12 16.3			29 06.1			15 20.1	
	10 20.1			27 10.0			12 23.9			29 13.8			16 03.8	
	11 03.8			27 17.7			13 07.6			29 21.4			16 11.4	
	11 11.4			28 01.4			13 15.2			30 05.1			16 19.1	
	11 19.1			28 09.0			13 22.9			30 12.8			17 02.7	
	12 02.8			28 16.7			14 06.5			30 20.4			17 10.4	
	12 10.4			29 00.3			14 14.2		May	1 04.1			17 18.0	
	12 18.1			29 08.0			14 21.8			1 11.7			18 01.7	

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER

Date	Light Time	Stellar Magnitude	P	$A_{\odot}+180^{\circ}$	D_{\odot}	$A_{\odot}+180^{\circ}$	D_{\odot}
Jan. 1	^m 49.60	-1.4	17.18	90.88	-3.07	82.58	-3.04
8	48.81	1.4	16.80	92.04	3.10	83.12	3.05
15	47.98	1.4	16.44	93.10	3.12	83.65	3.05
22	47.10	1.5	16.11	94.07	3.14	84.19	3.05
29	46.19	1.5	15.81	94.93	3.17	84.72	3.06
Feb. 5	45.25	-1.6	15.54	95.68	-3.19	85.25	-3.06
12	44.31	1.6	15.32	96.29	3.22	85.79	3.06
19	43.36	1.7	15.15	96.77	3.24	86.33	3.06
26	42.43	1.7	15.03	97.11	3.26	86.86	3.06
Mar. 5	41.53	1.8	14.96	97.30	3.28	87.40	3.07
12	40.66	-1.8	14.94	97.33	-3.30	87.93	-3.07
19	39.84	1.8	14.99	97.21	3.31	88.47	3.07
26	39.09	1.9	15.08	96.95	3.32	89.00	3.07
Apr. 2	38.42	1.9	15.23	96.53	3.33	89.54	3.07
9	37.83	2.0	15.42	95.98	3.34	90.08	3.07
16	37.35	-2.0	15.66	95.32	-3.34	90.62	-3.07
23	36.98	2.0	15.92	94.56	3.34	91.15	3.07
30	36.72	2.0	16.21	93.73	3.32	91.69	3.07
May 7	36.58	2.0	16.51	92.85	3.31	92.23	3.07
14	36.56	2.0	16.80	91.96	3.29	92.77	3.07
21	36.66	-2.0	17.10	91.08	-3.27	93.30	-3.06
28	36.89	2.0	17.37	90.25	3.24	93.84	3.06
June 4	37.23	2.0	17.61	89.49	3.21	94.38	3.06
11	37.67	2.0	17.82	88.83	3.17	94.92	3.06
18	38.21	1.9	17.99	88.28	3.14	95.46	3.06
25	38.83	-1.9	18.13	87.87	-3.11	96.00	-3.05
July 2	39.53	1.9	18.21	87.59	3.07	96.54	3.05
9	40.30	1.8	18.26	87.46	3.04	97.08	3.05
16	41.11	1.8	18.25	87.48	3.01	97.63	3.04
23	41.96	1.8	18.20	87.64	2.98	98.17	3.04
30	42.83	-1.7	18.11	87.95	-2.95	98.71	-3.03
Aug. 6	43.72	1.7	17.98	88.40	2.93	99.25	3.03
13	44.62	1.6	17.80	88.97	2.91	99.79	3.02
20	45.50	1.6	17.58	89.68	2.90	100.34	3.02
27	46.37	1.5	17.32	90.49	2.88	100.88	3.02
Sept. 3	47.21	-1.5	17.02	91.42	-2.87	101.42	-3.01
10	48.02	1.5	16.68	92.44	2.86	101.97	3.00
17	48.78	1.4	16.31	93.55	2.85	102.51	3.00
24	49.49	1.4	15.90	94.74	2.84	103.05	2.99
Oct. 1	50.15	1.4	15.45	96.01	2.84	103.60	2.98
8	50.74	-1.4	14.98	97.34	-2.83	104.14	-2.98
15	51.26	1.3	14.47	98.72	2.83	104.69	2.97
22	51.71	1.3	13.94	100.16	2.82	105.24	2.96
29	52.09	1.3	13.38	101.64	2.82	105.78	2.95
...
Dec. 24	51.99	-1.3	8.31	113.99	-2.77	110.17	-2.88
31	51.59	-1.3	7.66	115.50	-2.77	110.72	-2.87

JUPITER, 1935

591

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER

Date	Equatorial Diameter	Excess of Equat. Diameter over Polar	<i>i</i>	<i>q</i>	<i>Q</i>	Central Meridian		Correc- tion for Phase
						System I	System II	
Jan. 1	32.99	2.19	8.29	0.17	287.23	244.50	288.66	+0.30
8	33.53	2.23	8.91	0.20	286.73	269.12	259.87	0.35
15	34.11	2.26	9.44	0.23	286.27	293.87	231.20	0.39
22	34.75	2.31	9.87	0.26	285.84	318.74	202.66	0.42
29	35.43	2.35	10.20	0.28	285.45	343.73	174.23	0.45
Feb. 5	36.16	2.40	10.41	0.30	285.09	8.86	145.94	+0.47
12	36.93	2.45	10.49	0.31	284.77	34.12	117.79	0.48
19	37.74	2.51	10.43	0.31	284.48	59.51	89.77	0.47
26	38.56	2.56	10.24	0.31	284.22	85.04	61.88	0.46
Mar. 5	39.41	2.62	9.89	0.29	284.00	110.71	34.13	0.43
12	40.25	2.67	9.39	0.27	283.81	136.50	6.52	+0.38
19	41.07	2.73	8.74	0.24	283.64	162.42	339.02	0.33
26	41.86	2.78	7.93	0.20	283.48	188.44	311.63	0.27
Apr. 2	42.59	2.83	6.99	0.16	283.25	214.57	284.34	0.21
9	43.25	2.87	5.90	0.11	282.96	240.77	257.13	0.15
16	43.81	2.91	4.71	0.07	282.51	267.03	229.98	+0.10
23	44.26	2.94	3.41	0.04	281.54	293.32	202.86	0.05
30	44.57	2.96	2.05	0.01	279.06	319.61	175.74	+0.02
May 7	44.74	2.97	0.66	0.00	265.05	345.88	148.59	0.00
14	44.76	2.97	0.84	0.00	122.33	12.08	121.38	0.00
21	44.63	2.96	2.23	0.02	112.24	38.19	94.08	-0.02
28	44.36	2.95	3.59	0.04	110.06	64.18	66.67	0.06
June 4	43.96	2.92	4.89	0.08	109.19	90.04	39.12	0.10
11	43.44	2.89	6.08	0.12	108.73	115.73	11.39	0.16
18	42.83	2.84	7.17	0.17	108.47	141.24	343.50	0.22
25	42.14	2.80	8.13	0.21	108.27	166.58	315.43	-0.29
July 2	41.39	2.75	8.94	0.25	108.11	191.73	287.18	0.35
9	40.61	2.70	9.61	0.29	107.96	216.70	258.74	0.40
16	39.81	2.65	10.14	0.31	107.80	241.48	230.12	0.45
23	39.00	2.59	10.51	0.33	107.62	266.10	201.33	0.48
30	38.20	2.54	10.74	0.34	107.41	290.56	172.38	-0.50
Aug. 6	37.43	2.49	10.84	0.33	107.18	314.87	143.29	0.51
13	36.68	2.44	10.81	0.33	106.93	339.05	114.06	0.51
20	35.96	2.39	10.65	0.31	106.64	3.11	84.72	0.49
27	35.29	2.34	10.37	0.29	106.31	27.06	55.26	0.47
Sept. 3	34.66	2.30	9.99	0.26	105.97	50.93	25.72	-0.44
10	34.08	2.26	9.52	0.24	105.58	74.71	356.10	0.40
17	33.55	2.23	8.95	0.20	105.14	98.43	326.42	0.35
24	33.07	2.20	8.30	0.17	104.66	122.11	296.69	0.30
Oct. 1	32.63	2.17	7.58	0.14	104.15	145.74	266.92	0.25
8	32.25	2.14	6.80	0.11	103.59	169.35	237.12	-0.20
15	31.92	2.12	5.96	0.09	102.95	192.95	207.30	0.15
22	31.64	2.10	5.07	0.06	102.25	216.54	177.49	0.11
29	31.42	2.09	4.14	0.04	101.42	240.13	147.68	-0.07
...
Dec. 24	31.48	2.09	3.82	0.03	280.03	70.24	270.50	+0.06
31	31.72	2.11	4.77	0.05	279.03	94.28	241.13	+0.10

LONGITUDE OF CENTRAL MERIDIAN OF ILLUMINATED DISC
 SYSTEM I

Jan. 1	244.8	Feb. 21	15.8	Apr. 13	153.0	June 3	292.0	July 24	63.4	Sept. 13	187.4
2	42.6	22	173.8	14	311.1	4	89.9	25	221.2	14	345.0
3	200.4	23	331.7	15	109.1	5	247.9	26	19.0	15	142.7
4	358.2	24	129.6	16	267.1	6	45.8	27	176.8	16	300.4
5	156.0	25	287.6	17	65.2	7	203.8	28	334.5	17	98.1
6	313.8	26	85.5	18	223.2	8	1.8	29	132.3	18	255.8
7	111.6	27	243.4	19	21.2	9	159.7	30	290.1	19	53.4
8	269.5	28	41.4	20	179.3	10	317.6	31	87.8	20	211.1
9	67.3	Mar. 1	199.3	21	337.3	11	115.6	Aug. 1	245.6	21	8.8
10	225.1	2	357.3	22	135.3	12	273.5	2	43.4	22	166.5
11	22.9	3	155.2	23	293.4	13	71.4	3	201.1	23	324.1
12	180.8	4	313.2	24	91.4	14	229.4	4	358.9	24	121.8
13	338.6	5	111.1	25	249.4	15	27.3	5	156.6	25	279.5
14	136.4	6	269.1	26	47.5	16	185.2	6	314.4	26	77.2
15	294.3	7	67.0	27	205.5	17	343.1	7	112.1	27	234.8
16	92.1	8	225.0	28	3.6	18	141.0	8	269.8	28	32.5
17	249.9	9	23.0	29	161.6	19	298.9	9	67.6	29	190.2
18	47.8	10	180.9	30	319.6	20	96.8	10	225.3	30	347.8
19	205.6	11	338.9	May 1	117.7	21	254.7	11	23.1	Oct. 1	145.5
20	3.5	12	136.9	2	275.7	22	52.6	12	180.8	2	303.2
21	161.3	13	294.8	3	73.7	23	210.5	13	338.5	3	100.8
22	319.2	14	92.8	4	231.8	24	8.4	14	136.3	4	258.5
23	117.0	15	250.8	5	29.8	25	166.3	15	294.0	5	56.2
24	274.9	16	48.8	6	187.8	26	324.2	16	91.7	6	213.8
25	72.7	17	206.8	7	345.9	27	122.0	17	249.4	7	11.5
26	230.6	18	4.8	8	143.9	28	279.9	18	47.2	8	169.2
27	28.4	19	162.8	9	301.9	29	77.8	19	204.9	9	326.8
28	186.3	20	320.7	10	100.0	30	235.7	20	2.6	10	124.5
29	344.2	21	118.7	11	258.0	July 1	33.5	21	160.3	11	282.1
30	142.0	22	276.7	12	56.0	2	191.4	22	318.0	12	79.8
31	299.9	23	74.7	13	214.1	3	349.2	23	115.8	13	237.5
eb. 1	97.8	24	232.7	14	12.1	4	147.1	24	273.5	14	35.1
2	255.7	25	30.7	15	170.1	5	304.9	25	71.2	15	192.8
3	53.6	26	188.7	16	328.1	6	102.8	26	228.9	16	350.4
4	211.4	27	346.7	17	126.1	7	260.6	27	26.6	17	148.1
5	9.3	28	144.7	18	284.2	8	58.4	28	184.3	18	305.8
6	167.2	29	302.7	19	82.2	9	216.3	29	342.0	19	103.4
7	325.1	30	100.8	20	240.2	10	14.1	30	139.7	20	261.1
8	123.0	31	258.8	21	38.2	11	172.0	31	297.4	21	58.8
9	280.9	Apr. 1	56.8	22	196.2	12	329.8	Sept. 1	95.1	22	216.4
10	78.8	2	214.8	23	354.2	13	127.6	2	252.8	23	14.1
11	236.7	3	12.8	24	152.2	14	285.4	3	50.5	24	171.8
12	34.6	4	170.8	25	310.2	15	83.2	4	208.2	25	329.4
13	192.5	5	328.8	26	108.2	16	241.0	5	5.9	26	127.1
14	350.4	6	126.9	27	266.2	17	38.8	6	163.6	27	284.7
15	148.3	7	284.9	28	64.1	18	196.6	7	321.2	...	...
16	306.2	8	82.9	29	222.1	19	354.4	8	118.9	Dec. 27	183.5
17	104.1	9	240.9	30	20.1	20	152.2	9	276.6	28	341.2
18	262.1	10	39.0	31	178.1	21	310.0	10	74.3	29	138.9
19	60.0	11	197.0	June 1	336.0	22	107.8	11	232.0	30	296.6
20	217.9	12	355.0	2	134.0	23	265.6	12	29.7	31	94.4

JUPITER, 1935

MOVEMENT OF THE CENTRAL MERIDIAN SYSTEM I

593

	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	8 ^h	9 ^h	10 ^h	11 ^h
m	0°0	36°6	73°2	109°7	146°3	182°9	219°5	256°1	292°7	329°2	5°8	42°4
1	0°6	37°2	73°8	110°4	146°9	183°5	220°1	256°7	293°3	329°8	6°4	43°0
2	1°2	37°8	74°4	111°0	147°5	184°1	220°7	257°3	293°9	330°5	7°0	43°6
3	1°8	38°4	75°0	111°6	148°2	184°7	221°3	257°9	294°5	331°1	7°6	44°2
4	2°4	39°0	75°6	112°2	148°8	185°3	221°9	258°5	295°1	331°7	8°3	44°8
5	3°0	39°6	76°2	112°8	149°4	186°0	222°5	259°1	295°7	332°3	8°9	45°4
6	3°7	40°2	76°8	113°4	150°0	186°6	223°1	259°7	296°3	332°9	9°5	46°1
7	4°3	40°8	77°4	114°0	150°6	187°2	223°8	260°3	296°9	333°5	10°1	46°7
8	4°9	41°5	78°0	114°6	151°2	187°8	224°4	260°9	297°5	334°1	10°7	47°3
9	5°5	42°1	78°6	115°2	151°8	188°4	225°0	261°6	298°1	334°7	11°3	47°9
10	6°1	42°7	79°3	115°8	152°4	189°0	225°6	262°2	298°7	335°3	11°9	48°5
11	6°7	43°3	79°9	116°5	153°0	189°6	226°2	262°8	299°4	335°9	12°5	49°1
12	7°3	43°9	80°5	117°1	153°6	190°2	226°8	263°4	300°0	336°5	13°1	49°7
13	7°9	44°5	81°1	117°7	154°3	190°8	227°4	264°0	300°6	337°2	13°7	50°3
14	8°5	45°1	81°7	118°3	154°9	191°4	228°0	264°6	301°2	337°8	14°3	50°9
15	9°1	45°7	82°3	118°9	155°5	192°1	228°6	265°2	301°8	338°4	15°0	51°5
16	9°8	46°3	82°9	119°5	156°1	192°7	229°2	265°8	302°4	339°0	15°6	52°1
17	10°4	46°9	83°5	120°1	156°7	193°3	229°9	266°4	303°0	339°6	16°2	52°8
18	11°0	47°6	84°1	120°7	157°3	193°9	230°5	267°0	303°6	340°2	16°8	53°4
19	11°6	48°2	84°7	121°3	157°9	194°5	231°1	267°7	304°2	340°8	17°4	54°0
20	12°2	48°8	85°4	121°9	158°5	195°1	231°7	268°3	304°8	341°4	18°0	54°6
21	12°8	49°4	86°0	122°5	159°1	195°7	232°3	268°9	305°5	342°0	18°6	55°2
22	13°4	50°0	86°6	123°2	159°7	196°3	232°9	269°5	306°1	342°6	19°2	55°8
23	14°0	50°6	87°2	123°8	160°3	196°9	233°5	270°1	306°7	343°3	19°8	56°4
24	14°6	51°2	87°8	124°4	161°0	197°5	234°1	270°7	307°3	343°9	20°4	57°0
25	15°2	51°8	88°4	125°0	161°6	198°1	234°7	271°3	307°9	344°5	21°1	57°6
26	15°9	52°4	89°0	125°6	162°2	198°8	235°3	271°9	308°5	345°1	21°7	58°2
27	16°5	53°0	89°6	126°2	162°8	199°4	235°9	272°5	309°1	345°7	22°3	58°9
28	17°1	53°7	90°2	126°8	163°4	200°0	236°6	273°1	309°7	346°3	22°9	59°5
29	17°7	54°3	90°8	127°4	164°0	200°6	237°2	273°7	310°3	346°9	23°5	60°1
30	18°3	54°9	91°5	128°0	164°6	201°2	237°8	274°4	310°9	347°5	24°1	60°7
31	18°9	55°5	92°1	128°6	165°2	201°8	238°4	275°0	311°6	348°1	24°7	61°3
32	19°5	56°1	92°7	129°3	165°8	202°4	239°0	275°6	312°2	348°7	25°3	61°9
33	20°1	56°7	93°3	129°9	166°4	203°0	239°6	276°2	312°8	349°4	25°9	62°5
34	20°7	57°3	93°9	130°5	167°1	203°6	240°2	276°8	313°4	350°0	26°5	63°1
35	21°3	57°9	94°5	131°1	167°7	204°2	240°8	277°4	314°0	350°6	27°2	63°7
36	21°9	58°5	95°1	131°7	168°3	204°9	241°4	278°0	314°6	351°2	27°8	64°3
37	22°6	59°1	95°7	132°3	168°9	205°5	242°0	278°6	315°2	351°8	28°4	65°0
38	23°2	59°7	96°3	132°9	169°5	206°1	242°7	279°2	315°8	352°4	29°0	65°6
39	23°8	60°4	96°9	133°5	170°1	206°7	243°3	279°8	316°4	353°0	29°6	66°2
40	24°4	61°0	97°6	134°1	170°7	207°3	243°9	280°5	317°0	353°6	30°2	66°8
41	25°0	61°6	98°2	134°7	171°3	207°9	244°5	281°1	317°6	354°2	30°8	67°4
42	25°6	62°2	98°8	135°4	171°9	208°5	245°1	281°7	318°3	354°8	31°4	68°0
43	26°2	62°8	99°4	136°0	172°5	209°1	245°7	282°3	318°9	355°4	32°0	68°6
44	26°8	63°4	100°0	136°6	173°2	209°7	246°3	282°9	319°5	356°1	32°6	69°2
45	27°4	64°0	100°6	137°2	173°8	210°3	246°9	283°5	320°1	356°7	33°2	69°8
46	28°0	64°6	101°2	137°8	174°4	211°0	247°5	284°1	320°7	357°3	33°9	70°4
47	28°7	65°2	101°8	138°4	175°0	211°6	248°1	284°7	321°3	357°9	34°5	71°0
48	29°3	65°8	102°4	139°0	175°6	212°2	248°8	285°3	321°9	358°5	35°1	71°7
49	29°9	66°5	103°0	139°6	176°2	212°8	249°4	285°9	322°5	359°1	35°7	72°3
50	30°5	67°1	103°6	140°2	176°8	213°4	250°0	286°6	323°1	359°7	36°3	72°9
51	31°1	67°7	104°3	140°8	177°4	214°0	250°6	287°2	323°7	0°3	36°9	73°5
52	31°7	68°3	104°9	141°4	178°0	214°6	251°2	287°8	324°4	0°9	37°5	74°1
53	32°3	68°9	105°5	142°1	178°6	215°2	251°8	288°4	325°0	1°5	38°1	74°7
54	32°9	69°5	106°1	142°7	179°2	215°8	252°4	289°0	325°6	2°2	38°7	75°3
55	33°5	70°1	106°7	143°3	179°9	216°4	253°0	289°6	326°2	2°8	39°3	75°9
56	34°1	70°7	107°3	143°9	180°5	217°0	253°6	290°2	326°8	3°4	40°0	76°5
57	34°8	71°3	107°9	144°5	181°1	217°7	254°2	290°8	327°4	4°0	40°6	77°1
58	35°4	71°9	108°5	145°1	181°7	218°3	254°8	291°4	328°0	4°6	41°2	77°8
59	36°0	72°6	109°1	145°7	182°3	218°9	255°5	292°0	328°6	5°2	41°8	78°4
60	36°6	73°2	109°7	146°3	182°9	219°5	256°1	292°7	329°2	5°8	42°4	79°0

JUPITER, 1935

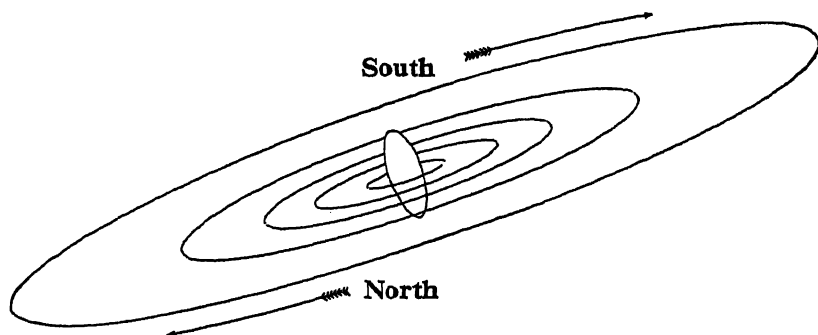
LONGITUDE OF CENTRAL MERIDIAN OF ILLUMINATED DISC
SYSTEM II

Jan. 1	289.0	Feb. 21	30.8	Apr. 13	138.9	June 3	248.7	July 24	351.0	Sept. 13	85.9
2	79.1	22	181.1	14	289.3	4	39.0	25	141.2	14	235.9
3	229.3	23	331.4	15	79.7	5	189.4	26	291.3	15	26.0
4	19.5	24	121.7	16	230.1	6	339.7	27	81.5	16	176.0
5	169.7	25	272.0	17	20.5	7	130.0	28	231.6	17	326.1
6	319.8	26	62.3	18	170.9	8	280.3	29	21.7	18	116.1
7	110.0	27	212.6	19	321.3	9	70.6	30	171.9	19	266.2
8	260.2	28	3.0	20	111.7	10	220.9	31	322.0	20	56.2
9	50.4	Mar. 1	153.3	21	262.1	11	11.2	Aug. 1	112.2	21	206.3
10	200.6	2	303.6	22	52.5	12	161.5	2	262.3	22	356.3
11	350.8	3	93.9	23	202.9	13	311.8	3	52.4	23	146.4
12	141.0	4	244.2	24	353.3	14	102.1	4	202.5	24	296.4
13	291.2	5	34.6	25	143.7	15	252.4	5	352.7	25	86.4
14	81.4	6	184.9	26	294.1	16	42.7	6	142.8	26	236.5
15	231.6	7	335.2	27	84.5	17	193.0	7	292.9	27	26.5
16	21.8	8	125.6	28	234.9	18	343.3	8	83.0	28	176.5
17	172.0	9	275.9	29	25.3	19	133.6	9	233.1	29	326.6
18	322.2	10	66.2	30	175.8	20	283.8	10	23.2	30	116.6
19	112.4	11	216.6	May 1	326.2	21	74.1	11	173.4	Oct. 1	266.7
20	262.6	12	6.9	2	116.6	22	224.4	12	323.5	2	56.7
21	52.9	13	157.2	3	267.0	23	14.6	13	113.6	3	206.7
22	203.1	14	307.6	4	57.4	24	164.9	14	263.7	4	356.8
23	353.3	15	97.9	5	207.8	25	315.2	15	53.8	5	146.8
24	143.5	16	248.3	6	358.2	26	105.4	16	203.9	6	296.8
25	293.8	17	38.6	7	148.6	27	255.6	17	354.0	7	86.9
26	84.0	18	189.0	8	299.0	28	45.9	18	144.0	8	236.9
27	234.2	19	339.4	9	89.4	29	196.1	19	294.1	9	27.0
28	24.4	20	129.7	10	239.8	30	346.4	20	84.2	10	177.0
29	174.7	21	280.1	11	30.2	July 1	136.6	21	234.3	11	327.0
30	324.9	22	70.4	12	180.6	2	286.8	22	24.4	12	117.0
31	115.2	23	220.8	13	331.0	3	77.1	23	174.5	13	267.1
Feb. 1	265.4	24	11.2	14	121.4	4	227.3	24	324.6	14	57.1
2	55.7	25	161.5	15	271.8	5	17.5	25	114.6	15	207.2
3	205.9	26	311.9	16	62.2	6	167.7	26	264.7	16	357.2
4	356.2	27	102.3	17	212.5	7	317.9	27	54.8	17	147.2
5	146.4	28	252.6	18	2.9	8	108.1	28	204.9	18	297.2
6	296.7	29	43.0	19	153.3	9	258.3	29	354.9	19	87.3
7	86.9	30	193.4	20	303.7	10	48.5	30	145.0	20	237.3
8	237.2	31	343.8	21	94.1	11	198.7	31	295.1	21	27.4
9	27.5	Apr. 1	134.2	22	244.4	12	348.9	Sept. 1	85.2	22	177.4
10	177.7	2	284.6	23	34.8	13	139.1	2	235.2	23	327.4
11	328.0	3	74.9	24	185.2	14	289.3	3	25.3	24	117.4
12	118.3	4	225.3	25	335.5	15	79.5	4	175.4	25	267.5
13	268.5	5	15.7	26	125.9	16	229.7	5	325.4	26	57.5
14	58.8	6	166.1	27	276.2	17	19.8	6	115.5	27	207.5
15	209.1	7	316.5	28	66.6	18	170.0	7	265.5	...	...
16	359.4	8	106.9	29	217.0	19	320.2	8	55.6	Dec. 27	0.8
17	149.7	9	257.3	30	7.3	20	110.4	9	205.6	28	150.9
18	300.0	10	47.7	31	157.7	21	260.5	10	355.7	29	301.0
19	90.2	11	198.1	June 1	308.0	22	50.7	11	145.8	30	91.1
20	240.5	12	348.5	2	98.3	23	200.8	12	295.8	31	241.2

MOVEMENT OF THE CENTRAL MERIDIAN
SYSTEM II

	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	8 ^h	9 ^h	10 ^h	11 ^h
m	0°0	36°3	72°5	108°8	145°1	181°3	217°6	253°8	290°1	326°4	2°6	38°9
1	0°6	36°9	73°1	109°4	145°7	181°9	218°2	254°4	290°7	327°0	3°2	39°5
2	1°2	37°5	73°7	110°0	146°3	182°5	218°8	255°0	291°3	327°6	3°8	40°1
3	1°8	38°1	74°3	110°6	146°9	183°1	219°4	255°7	291°9	328°2	4°4	40°7
4	2°4	38°7	74°9	111°2	147°5	183°7	220°0	256°3	292°5	328°8	5°0	41°3
5	3°0	39°3	75°5	111°8	148°1	184°3	220°6	256°9	293°1	329°4	5°7	41°9
6	3°6	39°9	76°2	112°4	148°7	184°9	221°2	257°5	293°7	330°0	6°3	42°5
7	4°2	40°5	76°8	113°0	149°3	185°5	221°8	258°1	294°3	330°6	6°9	43°1
8	4°8	41°1	77°4	113°6	149°9	186°1	222°4	258°7	294°9	331°2	7°5	43°7
9	5°4	41°7	78°0	114°2	150°5	186°8	223°0	259°3	295°5	331°8	8°1	44°3
10	6°0	42°3	78°6	114°8	151°1	187°4	223°6	259°9	296°1	332°4	8°7	44°9
11	6°6	42°9	79°2	115°4	151°7	188°0	224°2	260°5	296°7	333°0	9°3	45°5
12	7°3	43°5	79°8	116°0	152°3	188°6	224°8	261°1	297°4	333°6	9°9	46°1
13	7°9	44°1	80°4	116°6	152°9	189°2	225°4	261°7	298°0	334°2	10°5	46°7
14	8°5	44°7	81°0	117°2	153°5	189°8	226°0	262°3	298°6	334°8	11°1	47°4
15	9°1	45°3	81°6	117°9	154°1	190°4	226°6	262°9	299°2	335°4	11°7	48°0
16	9°7	45°9	82°2	118°5	154°7	191°0	227°2	263°5	299°8	336°0	12°3	48°6
17	10°3	46°5	82°8	119°1	155°3	191°6	227°8	264°1	300°4	336°6	12°9	49°2
18	10°9	47°1	83°4	119°7	155°9	192°2	228°5	264°7	301°0	337°2	13°5	49°8
19	11°5	47°7	84°0	120°3	156°5	192°8	229°1	265°3	301°6	337°8	14°1	50°4
20	12°1	48°4	84°6	120°9	157°1	193°4	229°7	265°9	302°2	338°5	14°7	51°0
21	12°7	49°0	85°2	121°5	157°7	194°0	230°3	266°5	302°8	339°1	15°3	51°6
22	13°3	49°6	85°8	122°1	158°3	194°6	230°9	267°1	303°4	339°7	15°9	52°2
23	13°9	50°2	86°4	122°7	159°0	195°2	231°5	267°7	304°0	340°3	16°5	52°8
24	14°5	50°8	87°0	123°3	159°6	195°8	232°1	268°3	304°6	340°9	17°1	53°4
25	15°1	51°4	87°6	123°9	160°2	196°4	232°7	268°9	305°2	341°5	17°7	54°0
26	15°7	52°0	88°2	124°5	160°8	197°0	233°3	269°6	305°8	342°1	18°3	54°6
27	16°3	52°6	88°8	125°1	161°4	197°6	233°9	270°2	306°4	342°7	18°9	55°2
28	16°9	53°2	89°4	125°7	162°0	198°2	234°5	270°8	307°0	343°3	19°6	55°8
29	17°5	53°8	90°1	126°3	162°6	198°8	235°1	271°4	307°6	343°9	20°2	56°4
30	18°1	54°4	90°7	126°9	163°2	199°4	235°7	272°0	308°2	344°5	20°8	57°0
31	18°7	55°0	91°3	127°5	163°8	200°0	236°3	272°6	308°8	345°1	21°4	57°6
32	19°3	55°6	91°9	128°1	164°4	200°7	236°9	273°2	309°4	345°7	22°0	58°2
33	19°9	56°2	92°5	128°7	165°0	201°3	237°5	273°8	310°0	346°3	22°6	58°8
34	20°5	56°8	93°1	129°3	165°6	201°9	238°1	274°4	310°6	346°9	23°2	59°4
35	21°2	57°4	93°7	129°9	166°2	202°5	238°7	275°0	311°3	347°5	23°8	60°0
36	21°8	58°0	94°3	130°5	166°8	203°1	239°3	275°6	311°9	348°1	24°4	60°6
37	22°4	58°6	94°9	131°1	167°4	203°7	239°9	276°2	312°5	348°7	25°0	61°3
38	23°0	59°2	95°5	131°8	168°0	204°3	240°5	276°8	313°1	349°3	25°6	61°9
39	23°6	59°8	96°1	132°4	168°6	204°9	241°1	277°4	313°7	349°9	26°2	62°5
40	24°2	60°4	96°7	133°0	169°2	205°5	241°8	278°0	314°3	350°5	26°8	63°1
41	24°8	61°0	97°3	133°6	169°8	206°1	242°4	278°6	314°9	351°1	27°4	63°7
42	25°4	61°6	97°9	134°2	170°4	206°7	243°0	279°2	315°5	351°7	28°0	64°3
43	26°0	62°3	98°5	134°8	171°0	207°3	243°6	279°8	316°1	352°4	28°6	64°9
44	26°6	62°9	99°1	135°4	171°6	207°9	244°2	280°4	316°7	353°0	29°2	65°5
45	27°2	63°5	99°7	136°0	172°2	208°5	244°8	281°0	317°3	353°6	29°8	66°1
46	27°8	64°1	100°3	136°6	172°9	209°1	245°4	281°6	317°9	354°2	30°4	66°7
47	28°4	64°7	100°9	137°2	173°5	209°7	246°0	282°2	318°5	354°8	31°0	67°3
48	29°0	65°3	101°5	137°8	174°1	210°3	246°6	282°8	319°1	355°4	31°6	67°9
49	29°6	65°9	102°1	138°4	174°7	210°9	247°2	283°5	319°7	356°0	32°2	68°5
50	30°2	66°5	102°7	139°0	175°3	211°5	247°8	284°1	320°3	356°6	32°8	69°1
51	30°8	67°1	103°3	139°6	175°9	212°1	248°4	284°7	320°9	357°2	33°5	69°7
52	31°4	67°7	104°0	140°2	176°5	212°7	249°0	285°3	321°5	357°8	34°1	70°3
53	32°0	68°3	104°6	140°8	177°1	213°3	249°6	285°9	322°1	358°4	34°7	70°9
54	32°6	68°9	105°2	141°4	177°7	213°9	250°2	286°5	322°7	359°0	35°3	71°5
55	33°2	69°5	105°8	142°0	178°3	214°6	250°8	287°1	323°3	359°6	35°9	72°1
56	33°8	70°1	106°4	142°6	178°9	215°2	251°4	287°7	323°9	0°2	36°5	72°7
57	34°4	70°7	107°0	143°2	179°5	215°8	252°0	288°3	324°5	0°8	37°1	73°3
58	35°1	71°3	107°6	143°8	180°1	216°4	252°6	288°9	325°2	1°4	37°7	73°9
59	35°7	71°9	108°2	144°4	180°7	217°0	253°2	289°5	325°8	2°0	38°3	74°6
60	36°3	72°5	108°8	145°1	181°3	217°6	253°8	290°1	326°4	2°6	38°9	75°2

SATELLITES OF JUPITER, 1935



APPARENT ORBITS OF THE SATELLITES OF JUPITER AT DATE OF OPPOSITION, MAY 10, AS SEEN IN AN INVERTING TELESCOPE

The orbits are elongated in the ratio of three to one in the direction of their minor axes.

MEAN SYNODIC PERIODS OF THE SATELLITES

I	d	h	m	s	=	d	h	m	s
I	1	18	28	35.946	=	1.7698	60	49	
II	3	13	17	53.736	=	3.5540	94	17	
III	7	03	59	35.856	=	7.1663	87	22	
IV	16	18	05	06.916	=	16.7535	52	27	
V	11	57	27.635	=	0.4982	36	52		
VI					=	266.00			
VII					=	276.67			

SATELLITE V

GREENWICH MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION

Feb.	d	h	m	s	E	May	d	h	m	s	E	Feb.	d	h	m	s	W	May	d	h	m	s	W
	13	00.8			E		13	16.7			E		13	06.8			W		13	22.7			W
	23	00.0			E		23	15.8			E		23	06.0			W		23	21.8			W
Mar.	4	23.1			E	June	2	14.9			E	Mar.	5	05.1			W	June	2	20.9			W
	14	22.2			E		12	14.0			E		15	04.2			W		12	20.0			W
	24	21.3			E		22	13.1			E		25	03.3			W		22	19.1			W
Apr.	3	20.3			E	July	2	12.2			E	Apr.	4	02.3			W	July	2	18.2			W
	13	19.4			E		12	11.3			E		14	01.4			W		12	17.3			W
	23	18.5			E		22	10.5			E		24	00.5			W		22	16.5			W
May	3	17.6			E	Aug.	1	09.6			E	May	3	23.6			W	Aug.	1	15.6			W

MULTIPLES OF THE MEAN SYNODIC PERIOD OF SATELLITE V

1	...	d	h	m	s	6	...	d	h	m	s	11	...	d	h	m	s	16	...	d	h	m	s
1	...	0	12.0			6	...	2	23.7			11	...	5	11.5			16	...	7	23.3		
2	...	0	23.9			7	...	3	11.7			12	...	5	23.5			17	...	8	11.3		
3	...	1	11.9			8	...	3	23.7			13	...	6	11.4			18	...	8	23.2		
4	...	1	23.8			9	...	4	11.6			14	...	6	23.4			19	...	9	11.2		
5	...	2	11.8			10	...	4	23.6			15	...	7	11.4			20	...	9	23.2		

SATELLITES OF JUPITER, 1935

597

MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION SATELLITE I (Io)

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	1	17	43.7	Mar.	22	08	55.2	June	9	22	32.6	Aug.	28	13	32.0
	3	12	13.1		24	03	22.0		11	16	59.2		30	08	01.4
	5	06	42.5		25	21	48.7		13	11	25.7	Sept.	1	02	30.8
	7	01	11.9		27	16	15.4		15	05	52.4		2	21	00.3
	8	19	41.3		29	10	42.0		17	00	19.1		4	15	29.8
	10	14	10.5		31	05	08.6		18	18	45.9		6	09	59.4
	12	08	39.8	Apr.	1	23	35.0		20	13	12.7		8	04	29.0
	14	03	09.0		3	18	01.5		22	07	39.6		9	22	58.6
	15	21	38.2		5	12	27.9		24	02	06.6		11	17	28.3
	17	16	07.3		7	06	54.2		25	20	33.6		13	11	58.0
	19	10	36.3		9	01	20.5		27	15	00.7		15	06	27.9
	21	05	05.3		10	19	46.8		29	09	27.9		17	00	57.6
	22	23	34.3		12	14	13.0	July	1	03	55.2		18	19	27.5
	24	18	03.2		14	08	39.1		2	22	22.5		20	13	57.3
	26	12	32.0		16	03	05.3		4	16	49.8		22	08	27.3
	28	07	00.8		17	21	31.4		6	11	17.3		24	02	57.2
	30	01	29.5		19	15	57.4		8	05	44.8		25	21	27.2
Feb.	31	19	58.2		21	10	23.4		10	00	12.5		27	15	57.2
	2	14	26.8		23	04	49.4		11	18	40.1		29	10	27.2
	4	08	55.3		24	23	15.4		13	13	07.9	Oct.	1	04	57.3
	6	03	23.9		26	17	41.3		15	07	35.7		2	23	27.4
	7	21	52.3		28	12	07.2		17	02	03.6		4	17	57.5
	9	16	20.7		30	06	33.1		18	20	31.5		6	12	27.7
	11	10	49.0	May	2	00	59.0		20	14	59.6		8	06	57.8
	13	05	17.2		3	19	24.9		22	09	27.6		10	01	28.0
	14	23	45.4		5	13	50.8		24	03	55.8		11	19	58.2
	16	18	13.5		7	08	16.7		25	22	24.0		13	14	28.5
	18	12	41.6		9	02	42.6		27	16	52.3		15	08	58.7
	20	07	09.6		10	21	08.5		29	11	20.7				
	22	01	37.5		12	15	34.4		31	05	49.1				
	23	20	05.4		14	10	00.3	Aug.	2	00	17.6				
	25	14	33.1		16	04	26.2		3	18	46.2				
	27	09	00.9		17	22	52.2		5	13	14.8				
Mar.	1	03	28.5		19	17	18.1		7	07	43.4				
	2	21	56.1		21	11	44.1		9	02	12.2				
	4	16	23.6		23	06	10.1		10	20	41.0				
	6	10	51.1		25	00	36.2		12	15	09.8	Dec.	18	03	13.4
	8	05	18.5		26	19	02.3		14	09	38.8		19	21	43.8
	9	23	45.8		28	13	28.4		16	04	07.7		21	16	14.0
	11	18	13.0		30	07	54.6		17	22	36.8		23	10	44.4
	13	12	40.2	June	1	02	20.8		19	17	05.8		25	05	14.6
	15	07	07.4		2	20	47.1		21	11	35.0		26	23	44.9
	17	01	34.4		4	15	13.4		23	06	04.1		28	18	15.1
	18	20	01.4		6	09	39.7		25	00	33.4		30	12	45.3
	20	14	28.3		8	04	06.2		26	19	02.7		32	07	15.5

SATELLITES OF JUPITER, 1935

MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION
SATELLITE II (EUROPA)

Jan.	d	h	m	Mar.	d	h	m	June	d	h	m	Sept.	d	h	m
	3	00	43.0		25	18	16.7		15	08	44.4		5	02	04.3
	6	14	04.4		29	07	28.3		18	21	54.9		8	15	26.0
	10	03	25.8	Apr.	1	20	38.6		22	11	06.9		12	04	47.7
	13	16	46.6		5	09	49.4		26	00	18.3		15	18	09.9
	17	06	07.4		8	22	58.7		29	13	31.4		19	07	32.1
	20	19	27.5		12	12	08.6	July	3	02	44.0		22	20	54.8
	24	08	47.7		16	01	17.3		6	15	58.1		26	10	17.5
	27	22	07.0		19	14	26.4		10	05	11.8		29	23	40.5
	31	11	26.5		23	03	34.5		13	18	27.0	Oct.	3	13	03.6
Feb.	4	00	45.0		26	16	43.2		17	07	41.8		7	02	26.9
	7	14	03.6		30	05	50.8		20	20	58.0		10	15	50.3
	11	03	21.2	May	3	18	59.2		24	10	13.9		14	05	13.9
	14	16	38.9		7	08	06.6		27	23	31.0				
	18	05	55.6		10	21	15.0		31	12	48.0				
	21	19	12.4		14	10	22.4	Aug.	4	02	06.0				
	25	08	28.0		17	23	30.8		7	15	24.0				
	28	21	43.8		21	12	38.5		11	04	42.9				
Mar.	4	10	58.4		25	01	47.3		14	18	01.8				
	8	00	13.1		28	14	55.5		18	07	21.5				
	11	13	26.6	June	1	04	04.9		21	20	41.2	Dec.	20	19	49.6
	15	02	40.3		4	17	13.7		25	10	01.6		24	09	13.2
	18	15	52.7		8	06	23.8		28	23	22.0		27	22	36.7
	22	05	05.3		11	19	33.4	Sept.	1	12	43.2		31	12	00.1

SATELLITE III (GANYMEDE)

Jan.	d	h	m	Mar.	d	h	m	June	d	h	m	Sept.	d	h	m
	3	21	23.4		30	20	13.7		24	12	31.0		18	12	00.8
	11	01	38.3	Apr.	6	23	41.0	July	1	16	05.4		25	16	19.6
	18	05	49.9		14	03	04.4		8	19	44.4	Oct.	2	20	40.4
	25	09	58.1		21	06	25.1		15	23	28.6		10	01	02.9
Feb.	1	14	03.0		28	09	43.1		23	03	16.9				
	8	18	04.2	May	5	12	59.5		30	07	09.8				
	15	22	02.2		12	16	15.5	Aug.	6	11	06.3				
	23	01	55.5		19	19	32.0		13	15	06.7				
Mar.	2	05	44.6		26	22	50.5		20	19	10.7				
	9	09	28.7	June	3	02	10.8		27	23	18.3				
	16	13	08.0		10	05	34.3	Sept.	4	03	29.8	Dec.	20	21	39.2
	23	16	43.0		17	09	00.8		11	07	43.9		28	02	06.4

SATELLITE IV (CALLISTO)

Jan.	d	h	m	Mar.	d	h	m	June	d	h	m	Sept.	d	h	m
	0	23	40.8		25	16	54.9		16	18	03.0		8	09	08.8
	17	19	05.0	Apr.	11	08	06.6	July	3	09	42.5		25	04	46.2
Feb.	3	13	50.2		27	22	38.1		20	02	16.9	Oct.	12	00	51.3
	20	07	47.1	May	14	12	51.3	Aug.	5	19	46.0				
Mar.	9	00	49.4		31	03	11.7		22	14	06.1	Dec.	18	11	13.5

DIFFERENTIAL CO-ORDINATES OF SATELLITE VI

Date	$\alpha_{vi}-\alpha_J$	$\delta_{vi}-\delta_J$	Date	$\alpha_{vi}-\alpha_J$	$\delta_{vi}-\delta_J$	Date	$\alpha_{vi}-\alpha_J$	$\delta_{vi}-\delta_J$
Jan. 0	^m ₋₂ ^s ₁₁	+21'8	Apr. 10	^m ₊₃ ^s ₁₆	-19'3	July 19	^m ₋₃ ^s ₅₈	+ 5'4
4	2 00	22.6	14	3 06	21.9	23	3 57	7.6
8	1 48	23.2	18	2 53	24.2	27	3 55	9.7
12	1 35	23.6	22	2 37	26.1	31	3 51	11.6
16	1 20	23.9	26	2 18	27.7	Aug. 4	3 46	13.4
20	-1 05	+24.0	30	+1 57	-28.9	8	-3 40	+15.1
24	0 48	23.8	May 4	1 34	29.7	12	3 32	16.6
28	0 31	23.5	8	1 09	30.0	16	3 24	18.0
Feb. 1	-0 13	22.9	12	0 43	30.0	20	3 14	19.2
5	+0 06	22.0	16	+0 16	29.6	24	3 04	20.3
9	+0 25	+20.9	20	-0 10	-28.8	28	-2 53	+21.2
13	0 44	19.6	24	0 37	27.7	Sept. 1	2 41	22.0
17	1 04	17.9	28	1 03	26.2	5	2 28	22.6
21	1 24	16.0	June 1	1 28	24.4	9	2 15	23.1
25	1 43	13.8	5	1 51	22.4	13	2 01	23.4
Mar. 1	+2 02	+11.3	9	-2 13	-20.1	17	-1 46	+23.6
5	2 19	8.6	13	2 34	17.7	21	1 32	23.6
9	2 36	5.8	17	2 52	15.1	25	1 16	23.3
13	2 50	+ 2.7	21	3 08	12.5	29	1 01	23.0
17	3 03	- 0.5	25	3 21	9.8	Oct. 3	0 45	22.4
21	+3 12	- 3.8	29	-3 33	- 7.1	7	-0 29	+21.6
25	3 20	7.1	July 3	3 42	4.5	11	-0 13	20.7
29	3 24	10.4	7	3 49	- 1.9	15	+0 03	19.6
Apr. 2	3 24	13.5	11	3 54	+ 0.6	19	0 19	18.3
6	+3 22	-16.5	15	-3 57	+ 3.0	23	+0 34	+16.9

DIFFERENTIAL CO-ORDINATES OF SATELLITE VII

Date	$\alpha_{vii}-\alpha_J$	$\delta_{vii}-\delta_J$	Date	$\alpha_{vii}-\alpha_J$	$\delta_{vii}-\delta_J$	Date	$\alpha_{vii}-\alpha_J$	$\delta_{vii}-\delta_J$
Jan. 0	^m ₊₁ ^s ₀₉	- 7'7	Apr. 10	^m ₋₂ ^s ₀₅	+ 4'8	July 19	^m ₊₄ ^s ₁₆	+ 6'0
4	0 55	8.6	14	1 43	6.6	23	4 10	5.0
8	0 41	9.4	18	1 19	8.3	27	4 02	3.9
12	0 26	10.2	22	0 54	9.8	31	3 53	2.9
16	+0 10	11.0	26	-0 27	11.1	Aug. 4	3 43	1.9
20	-0 06	-11.7	30	+0 01	+12.2	8	+3 32	+ 0.9
24	0 22	12.3	May 4	0 28	13.1	12	3 21	- 0.1
28	0 39	12.8	8	0 56	13.9	16	3 09	1.0
Feb. 1	0 56	13.2	12	1 23	14.4	20	2 57	2.0
5	1 13	13.4	16	1 49	14.8	24	2 44	2.9
9	-1 30	-13.6	20	+2 14	+15.0	28	+2 30	- 3.9
13	1 47	13.5	24	2 37	15.2	Sept. 1	2 17	4.8
17	2 03	13.3	28	2 58	15.1	5	2 02	5.7
21	2 18	13.0	June 1	3 17	14.9	9	1 48	6.6
25	2 32	12.4	5	3 34	14.7	13	1 33	7.4
Mar. 1	-2 45	-11.6	9	+3 48	+14.3	17	+1 18	- 8.3
5	2 55	10.6	13	4 01	13.8	21	1 02	9.1
9	3 03	9.4	17	4 11	13.2	25	0 47	9.8
13	3 08	8.0	21	4 19	12.5	29	0 31	10.5
17	3 10	6.4	25	4 24	11.8	Oct. 3	0 16	11.1
21	-3 08	- 4.7	29	+4 28	+10.9	7	+0 01	-11.6
25	3 02	2.9	July 3	4 29	10.0	11	-0 14	12.0
29	2 53	- 0.9	7	4 28	9.1	15	0 28	12.4
Apr. 2	2 40	+ 1.0	11	4 26	8.1	19	0 42	12.6
6	-2 24	+ 3.0	15	+4 22	+ 7.0	23	-0 56	-12.7

JANUARY

Day		h	m	Day		h	m	Day		h	m	Day		h	m
0	I Em.	0	19	7	I Sh. f.	22	22	15	I E. c.	19	25.7	24	II E. c.	5	12.5
	III Sh. c.	2	19		I Tr. f.	23	24		I Em.	22	43		II Em.	10	00
	III Sh. f.	4	12					16	I Sh. c.	16	34		I E. c.	15	47.2
	III Tr. c.	6	14	8	II Sh. c.	5	57		I Tr. c.	17	41		I Em.	19	09
	III Tr. f.	8	07		II Tr. c.	8	03		I Sh. f.	18	43	25	III E. c.	4	12.2
	I Sh. c.	18	19		II Sh. f.	8	21		I Tr. f.	19	50		III E. f.	6	06.0
	I Tr. c.	19	17		II Tr. f.	10	27	17	II E. c.	2	38.3		III Im.	9	06
	I Sh. f.	20	29		I E. c.	17	32.5		II Em.	7	20		III Em.	10	51
	I Tr. f.	21	27		I Em.	20	46		I E. c.	13	54.0		I Sh. c.	12	56
1	II Sh. c.	3	22	9	I Sh. c.	14	41		I Em.	17	12		I Tr. c.	14	06
	II Tr. c.	5	20		I Tr. c.	15	44	18	III E. c.	0	15.2	26	II Sh. c.	0	23
	II Sh. f.	5	46		I Sh. f.	16	50		III E. f.	2	09.0		II Tr. c.	2	45
	II Tr. f.	7	44		I Tr. f.	17	53		III Im.	4	56		II Sh. f.	2	46
	I E. c.	15	39.1	10	II E. c.	0	04.3		III Em.	6	44		II Tr. f.	5	08
	I Em.	18	49		II Em.	4	38		I Sh. c.	11	03		I E. c.	10	15.5
2	I Sh. c.	12	48		I E. c.	12	00.8		I Tr. c.	12	10		I Em.	13	37
	I Tr. c.	13	47		I Em.	15	15	19	I Sh. f.	13	12	27	I Sh. c.	7	24
	I Sh. f.	14	57		III E. c.	20	17.9		I Tr. f.	14	19		I Tr. c.	8	35
	I Tr. f.	15	56		III E. f.	22	11.9		II Sh. c.	21	49		I Sh. f.	9	33
	II E. c.	21	30.4	11	III Im.	0	43		II Tr. c.	0	06		I Tr. f.	10	44
3	II Em.	1	56		III Em.	2	34	19	II Sh. f.	0	12		II E. c.	18	29.5
	I E. c.	10	07.4		I Sh. c.	9	09		II Tr. f.	2	29		II E. f.	20	54.2
	I Em.	13	18		I Tr. c.	10	14		I E. c.	8	22.3		II Im.	20	55
	III E. c.	16	19.9		I Sh. f.	11	18	20	I Em.	11	41	28	II Em.	23	19
	III E. f.	18	14.2		I Tr. f.	12	23		I Sh. c.	5	31		I E. c.	4	43.8
	III Im.	20	27		II Sh. c.	19	14		I Tr. c.	6	39		I Em.	8	06
	III Em.	22	20		II Tr. c.	21	25		I Sh. f.	7	40		III Sh. c.	18	09
4	I Sh. c.	7	16		II Tr. f.	21	38		I Tr. f.	8	48		III Sh. f.	20	01
	I Tr. c.	8	16	12	II Tr. f.	23	48		II E. c.	15	55.3		III Tr. c.	23	05
	I Sh. f.	9	25		I E. c.	6	29.1	21	II Em.	20	40	29	III Tr. f.	0	48
	I Tr. f.	10	25		I Em.	9	45		I E. c.	2	50.6		I Sh. c.	1	52
	II Sh. c.	16	40	13	I Sh. c.	3	38		I Em.	6	10		I Tr. c.	3	04
	II Tr. c.	18	42		I Tr. c.	4	43	22	III Sh. c.	14	12		I Sh. f.	4	01
	II Sh. f.	19	03		I Sh. f.	5	47		III Sh. f.	16	04		I Tr. f.	5	13
	II Tr. f.	21	06		I Tr. f.	6	52		III Tr. c.	18	57		II Sh. c.	13	40
5	I E. c.	4	35.8		II E. c.	13	21.2		III Tr. f.	20	42	30	II Sh. f.	16	03
	I Em.	7	48		II Em.	17	59		I Sh. c.	23	59		II Tr. c.	16	04
6	I Sh. c.	1	44	14	I E. c.	0	57.4						II Tr. f.	18	26
	I Tr. c.	2	46		I Em.	4	14	22	I Tr. c.	1	08		I E. c.	23	12.1
	I Sh. f.	3	54		III Sh. c.	10	14		I Sh. f.	2	08	31	I Em.	2	34
	I Tr. f.	4	55		III Sh. f.	12	06		I Tr. f.	3	17		I Sh. c.	20	21
	II E. c.	10	47.3		III Tr. c.	14	45		II Sh. c.	11	06		I Tr. c.	21	33
	II Em.	15	17		III Tr. f.	16	33		II Tr. c.	13	25		I Sh. f.	22	30
	I E. c.	23	04.1		I Sh. c.	22	06		II Sh. f.	13	29		I Tr. f.	23	41
					I Tr. c.	23	12	23	II Tr. f.	15	48		II E. c.	7	46.8
7	I Em.	2	17	15	I Sh. f.	0	15		I E. c.	21	18.9		II E. f.	10	11.5
	III Sh. c.	6	16		I Tr. f.	1	21		I Em.	0	39		II Im.	10	14
	III Sh. f.	8	09		II Sh. c.	8	32		I Sh. c.	18	27		II Em.	12	39
	III Tr. c.	10	31		II Tr. c.	10	45		I Tr. c.	19	37		I E. c.	17	40.3
	III Tr. f.	12	21		II Tr. f.	10	55		I Sh. f.	20	36		I Em.	21	03
	I Sh. c.	20	13		II Tr. f.	13	08		I Tr. f.	21	46				
	I Tr. c.	21	15												
I				II				III				IV			
Jan. 1, $x_1 = -1.8$; $y_1 = -0.3$				Jan. 2, $x_1 = -2.2$; $y_1 = -0.5$				Jan. 17, $x_1 = -3.0$; $y_1 = -0.8$				No eclipse			
Jan. 15, $x_1 = -1.9$; $y_1 = -0.3$				Jan. 17, $x_1 = -2.4$; $y_1 = -0.5$				Jan. 18, $x_1 = -2.0$; $y_1 = -0.8$							
Eclipse commences ... E. c.				Transit commences ... Tr. c.											
Eclipse finishes ... E. f.				Transit finishes ... Tr. f.											
Occultation, immersion ... Im.				Shadow commences ... Sh. c.											
Occultation, emersion ... Em.				Shadow finishes ... Sh. f.											

SATELLITES OF JUPITER, 1935

601

JANUARY

Configurations at 5^h 30^m

Day	West	East
0	4 3 1 2	2 1
1	3 1	4 2 1
2	3 2	1 4
3	3 1	2 4
4		1 3 2 4
5	2	1 3 4
6	2 1	3 4
7		1 3 2 4
8	3 1	2 4
9	3 2	4 1
10	3 4 1	2
11	4	1 3 2
12	4 2 1	3
13	4 2	3 1 2
14	4	1 3 2
15	4 3 1	2
16	3 4 2	1
17	3 4 1	
18	3	1 4 2
19	1 2	3 4
20	2 1	3 4
21		2 3 4 1
22	3 1	2 4
23	3 2	1 4
24	3 1 2	4
25	3	1 4 2
26	1 2 4	3
27	4 2	1 3
28	4	1 2 3
29	4 3 1	2
30	4 3 2	1
31	4 3 1	2

PHASES OF THE ECLIPSES

I

c*



II

c*



III

c* f*



IV

No eclipse of this Satellite

SATELLITES OF JUPITER, 1935

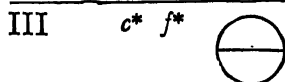
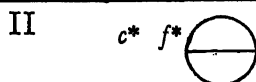
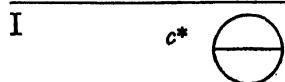
FEBRUARY

Day		h	m	Day		h	m	Day		h	m	Day		h	m
1	III E. c.	8	09.5	8	III E. c.	12	06.4	15	I Em.	0	50	22	I Em.	2	42
	III E. f.	10	02.9		III E. f.	13	59.8		III E. c.	16	04.2		III E. c.	20	01.5
	III Im.	13	12		I Sh. c.	16	42		III E. f.	17	57.5		I Sh. c.	20	29
	I Sh. c.	14	49		III Im.	17	14		I Sh. c.	18	35		I Tr. c.	21	42
	III Em.	14	54		I Tr. c.	17	56		I Tr. c.	19	49		III E. f.	21	54.8
	I Tr. c.	16	02		I Sh. f.	18	51		I Sh. f.	20	44		I Sh. f.	22	38
	I Sh. f.	16	58		III Em.	18	54		III Im.	21	13		I Tr. f.	23	50
	I Tr. f.	18	10		I Tr. f.	20	04		I Tr. f.	21	57				
									III Em.	22	51				
2	II Sh. c.	2	57	9	II Sh. c.	5	31	16	II Sh. c.	8	04	23	III Im.	1	08
	II Sh. f.	5	20		II Sh. f.	7	54		II Sh. f.	10	27		III Em.	2	43
	II Tr. c.	5	23		II Tr. c.	7	58		II Tr. c.	10	32		II Sh. c.	10	38
	II Tr. f.	7	45		II Tr. f.	10	20		II Tr. f.	12	53		II Tr. f.	13	01
	I E. c.	12	08.6		I E. c.	14	01.7		I E. c.	15	54.7		II Tr. f.	13	03
	I Em.	15	31		I Em.	17	25		I Em.	19	18		I E. c.	15	24
													I E. c.	17	47.7
													I Em.	21	10
3	I Sh. c.	9	17	10	I Sh. c.	11	11	17	I Sh. c.	13	04	24	I Sh. c.	14	57
	I Tr. c.	10	30		I Tr. c.	12	24		I Tr. c.	14	17		I Tr. c.	16	10
	I Sh. f.	11	26		I Sh. f.	13	19		I Sh. f.	15	13		I Sh. f.	17	06
	I Tr. f.	12	39		I Tr. f.	14	33		I Tr. f.	16	26		I Tr. f.	18	18
	II E. c.	21	03.8		II E. c.	23	38.2								
	II E. f.	23	28.6												
	II Im.	23	33												
4	II Em.	1	57	11	II E. f.	2	03.2	18	II E. c.	2	12.9	25	II E. c.	4	47.6
	I E. c.	6	36.9		II Im.	2	09		II E. f.	4	38.0		II E. f.	7	13.0
	I Em.	10	00		II Em.	4	33		II Im.	4	44		II Im.	7	16
	III Sh. c.	22	07		I E. c.	8	29.9		II Em.	7	07		II Em.	9	40
	III Sh. f.	23	59		I Em.	11	53		I E. c.	10	22.9		I E. c.	12	15.9
									I Em.	13	46		I Em.	15	37
5	III Tr. c.	3	10	12	III Sh. c.	2	04	19	III Sh. c.	6	01	26	I Sh. c.	9	25
	I Sh. c.	3	46		III Sh. f.	3	55		I Sh. c.	7	32		III Sh. c.	9	58
	III Tr. f.	4	50		I Sh. c.	5	39		III Sh. f.	7	52		I Tr. c.	10	38
	I Tr. c.	4	59		I Tr. c.	6	53		I Tr. c.	8	46		I Sh. f.	11	34
	I Sh. f.	5	55		III Tr. c.	7	10		I Sh. f.	9	41		III Sh. f.	11	49
	I Tr. f.	7	07		I Sh. f.	7	48		I Tr. f.	10	54		I Tr. f.	12	46
	II Sh. c.	16	14		III Tr. f.	8	47		III Tr. c.	11	07		III Tr. c.	14	59
	II Sh. f.	18	37		I Tr. f.	9	01		III Tr. f.	12	41		III Tr. f.	16	31
	II Tr. c.	18	41		II Sh. c.	18	48		II Sh. c.	21	21		II Sh. c.	23	54
	II Tr. f.	21	02		II Sh. f.	21	11		II Sh. f.	23	44				
					II Tr. c.	21	15		II Tr. c.	23	48				
					II Tr. f.	23	37								
6	I E. c.	1	05.2	13	I E. c.	2	58.2	20	II Tr. f.	2	09	27	II Sh. f.	2	18
	I Em.	4	28		I Em.	6	22		I E. c.	4	51.2		II Tr. c.	2	18
	I Sh. c.	22	14						I Em.	8	14		II Tr. f.	4	38
	I Tr. c.	23	27										I E. c.	6	44.2
													I Em.	10	05
7	I Sh. f.	0	23	14	I Sh. c.	0	07	21	I Sh. c.	2	00	28	I Sh. c.	3	54
	I Tr. f.	1	36		I Tr. c.	1	21		I Tr. c.	3	14		I Tr. c.	5	05
	II E. c.	10	21.2		I Sh. f.	2	16		I Sh. f.	4	09		I Sh. f.	6	03
	II E. f.	12	46.1		I Tr. f.	3	29		I Tr. f.	5	22		I Tr. f.	7	13
	II Im.	12	52		II E. c.	12	55.8		II E. c.	15	30.5		II E. c.	18	05.4
	II Em.	15	16		II E. f.	15	20.2		II E. f.	17	55.8		II E. f.	20	30.8
	I E. c.	19	33.4		II Im.	15	27		II Im.	18	01		II Im.	20	32
	I Em.	22	57		II Em.	17	51		II Em.	20	24		II Em.	22	55
					I E. c.	21	26.4		I E. c.	23	19.4				
I				II				III				IV			
Feb. 3, $x_1 = -2.0$; $y_1 = -0.3$				Feb. 14, $x_1 = -2.5$; $y_1 = -0.5$				Feb. 15, $x_1 = -3.2$; $y_1 = -0.8$				No eclipse			
Feb. 14, $x_1 = -2.0$; $y_1 = -0.3$				Feb. 14, $x_2 = -0.9$; $y_2 = -0.5$				Feb. 15, $x_2 = -2.2$; $y_2 = -0.8$							
Eclipse commences ... E. c.				Transit commences ... Tr. c.											
Eclipse finishes ... E. f.				Transit finishes ... Tr. f.											
Occultation, immersion ... Im.				Shadow commences ... Sh. c.											
Occultation, emersion ... Em.				Shadow finishes ... Sh. f.											

FEBRUARY

Configurations at 4 ^h 15 ^m				
Day	West		East	
1	4	3	1 2	
2	4	1	2 3	
3	2	4	1 3	
4		1 2 4 3		
5	3	1 2 4		
6	3 2		4	1
7	3 2 1		4	
8	3	1 2	4	
9	1	2 3	4	
10	2	1 3 4		
11		1 4 3		2
12		4 1 3 2		
13	1	4 3 2		
14	4 3	2 1		
15	4	3	1 2	
16	4	1	3 2	
17	4	2	1 3	
18	4	1 2	3	
19	4	1 3 2		
20	3	2 1 4		
21	3	2	4	1
22	3	1 2	4	
23		1 3 2	4	
24		2	1 3	4
25		1 2	3	4
26			1 3 2	4
27	2	3 1	4	
28	3	2	1 4	

PHASES OF THE ECLIPSES



IV No eclipse of this Satellite

MARCH

Day		h m	Day		h m	Day		h m	Day		h m
1	I E. c.	1 12.4	9	I Tr. f.	3 31	16	II Tr. c.	20 24	24	I Sh. c.	22 30 ^m
	I Em.	4 33		III E. c.	3 56.3		II Sh. f.	20 41		I Tr. c.	23 28
	I Sh. c.	22 22		III E. f.	5 49.6		II Tr. f.	22 44			
	I Tr. c.	23 33		III Im.	8 44		I E. c.	23 26.7			
	III E. c.	23 59.2		III Em.	10 13				25	I Sh. f.	0 40
2	I Sh. f.	0 31		II Sh. c.	15 44	17	I Em.	2 39		I Tr. f.	1 36
	I Tr. f.	1 41		II Tr. c.	17 59		I Sh. c.	20 37		II E. c.	15 08.5
	III E. f.	1 52.5		II Sh. f.	18 08		I Tr. c.	21 40		II Em.	19 28
	III Im.	4 59		II Tr. f.	20 19		I Sh. f.	22 46		I E. c.	19 48.0
	III Em.	6 31		I E. c.	21 33.7		I Tr. f.	23 48		I Em.	22 53
	II Sh. c.	13 11	10	I Em.	0 50	18	II E. c.	12 33.0	26	I Sh. c.	16 59
	II Tr. c.	15 32		I Sh. c.	18 43		II Em.	17 04		I Tr. c.	17 55
	II Sh. f.	15 34		I Tr. c.	19 51		I E. c.	17 54.9		I Sh. f.	19 08
	II Tr. f.	17 53		I Sh. f.	20 53		I Em.	21 06		I Tr. f.	20 03
	I E. c.	19 40.7		I Tr. f.	21 59	19	I Sh. c.	15 05	27	III Sh. c.	1 48
	I Em.	23 00					I Tr. c.	16 07		III Sh. f.	3 40
3	I Sh. c.	16 50	11	II E. c.	9 57.7		I Sh. f.	17 15		III Tr. c.	5 45
	I Tr. c.	18 01		II Em.	14 38		I Tr. f.	18 15		III Tr. f.	7 08
	I Sh. f.	18 59		I E. c.	16 01.9		III Sh. c.	21 51		II Sh. c.	10 07
	I Tr. f.	20 09		I Em.	19 17		III Sh. f.	23 43		II Tr. c.	11 57
4	II E. c.	7 22.6	12	I Sh. c.	13 12	20	III Tr. c.	2 11		II Sh. f.	12 31
	II Em.	12 10		I Tr. c.	14 18		III Tr. f.	3 35		II Tr. f.	14 16
	I E. c.	14 08.9		I Sh. f.	15 21		II Sh. c.	7 34		I E. c.	14 16.3
	I Em.	17 28		I Tr. f.	16 26		II Tr. c.	9 35		I Em.	17 19
				III Sh. c.	17 53		II Sh. f.	9 57			
5	I Sh. c.	11 19		III Sh. f.	19 45		II Tr. f.	11 55	28	I Sh. c.	11 27
	I Tr. c.	12 28		III Tr. c.	22 32		I E. c.	12 23.2		I Tr. c.	12 21
	I Sh. f.	13 28		III Tr. f.	23 58		I Em.	15 32		I Sh. f.	13 37
	III Sh. c.	13 55	13	II Sh. c.	5 01	21	I Sh. c.	9 34		I Tr. f.	14 29
	I Tr. f.	14 36		II Tr. c.	7 12		I Tr. c.	10 34	29	II E. c.	4 26.7
	III Sh. f.	15 47		II Sh. f.	7 24		I Sh. f.	11 43		II Em.	8 39
	III Tr. c.	18 48		II Tr. f.	9 32		I Tr. f.	12 42		I E. c.	8 44.6
	III Tr. f.	20 17		I E. c.	10 30.2					I Em.	11 46
				I Em.	13 44	22	II E. c.	1 51.1	30	I Sh. c.	5 55
6	II Sh. c.	2 28	14	I Sh. c.	7 40		II Em.	6 16		I Tr. c.	6 48
	II Tr. c.	4 46		I Tr. c.	8 46		I E. c.	6 51.4		I Sh. f.	8 05
	II Sh. f.	4 51		I Sh. f.	9 49		I Em.	9 59		I Tr. f.	8 56
	II Tr. f.	7 06		I Tr. f.	10 53	23	I Sh. c.	4 02		III E. c.	15 47.4
	I E. c.	8 37.2		II E. c.	23 15.7		I Tr. c.	5 01		III E. f.	17 40.8
	I Em.	11 55					I Sh. f.	6 11		III Im.	19 32
7	I Sh. c.	5 47	15	II Em.	3 51		I Tr. f.	7 09		III Em.	20 55
	I Tr. c.	6 56		I E. c.	4 58.4		III E. c.	11 50.3	31	II Tr. c.	1 07
	I Sh. f.	7 56		I Em.	8 12		III E. f.	13 43.7		II Sh. f.	1 47
	I Tr. f.	9 04					III Im.	16 01		I E. c.	3 12.8
	II E. c.	20 40.4	16	I Sh. c.	2 09		III Em.	17 25		II Tr. f.	3 26
				I Tr. c.	3 13		II Sh. c.	20 50		I Em.	6 13
				I Sh. f.	4 18		II Tr. c.	22 46			
				I Tr. f.	5 21		II Sh. f.	23 14			
				III E. c.	7 53.4	24	II Tr. f.	1 06			
				III E. f.	9 46.6		I E. c.	1 19.7			
				III Im.	12 25		I Em.	4 26			
				III Em.	13 51						
9	I Sh. c.	0 15		II Sh. c.	18 17						
	I Tr. c.	1 23									
	I Sh. f.	2 24									

I
Mar. 1, $x_1 = -2.0$; $y_1 = -0.3$
Mar. 15, $x_1 = -1.9$; $y_1 = -0.3$

II
Mar. 4, $x_1 = -2.4$; $y_1 = -0.3$
Mar. 14, $x_1 = -2.3$; $y_1 = -0.3$

III
Mar. 16, $x_1 = -2.9$; $y_1 = -0.9$
Mar. 16, $x_2 = -1.8$; $y_2 = -0.9$

IV
No eclipse

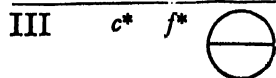
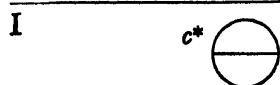
Eclipse commences ... E. c.
Eclipse finishes ... E. f.
Occultation, immersion ... Im.
Occultation, emersion ... Em.

Transit commences ... Tr. c.
Transit finishes ... Tr. f.
Shadow commences ... Sh. c.
Shadow finishes ... Sh. f.

MARCH

Configurations at 3 ^h 00 ^m			
Day	West	East	
1	•● I	•3 4•	○ 2
2	4•	I• ○ 3	2•
3	4•	2•	○ 1• 3
4	4•	I• 2	○ 3•
5	4•	○ I• 2	3•
6	4•	I• 3• 2	○
7	4 3• 2•	○ I•	
8	3• 4	○ I• 2	
9	I• ○	3• ○ 4	2•
10		2•	○ I• 3 4
11		2 I•	○ 3 4
12		○ I• 2 3•	4
13		I• 3•	○ 2• 4
14	3• 2•	○ I•	4•
15	3•	I• ○	4• ● 2
16		3• I•	○ 2• 4•
17		2•	○ I• 3
18		2 4• I•	○ 3
19	4•	○ I• 2 3•	
20	3• ○	4• I•	○ 2•
21	4•	3• 2•	○ I•
22	4•	3• I•	○ 2
23	4•	3•	○ I• 2•
24	● I	4•	2• ○ 3
25		2 4 I•	○ 3
26		○ I• 2	4 3•
27		I• 3•	○ 2• 4
28		3• 2•	○ I• 4
29		3• I• 2	○ 4
30		3•	○ I• 2 4•
31	2• ○	○ I• 3	4•

PHASES OF THE ECLIPSES



IV No eclipse of this Satellite

SATELLITES OF JUPITER, 1935

APRIL

Day		h	m	Day		h	m	Day		h	m	Day		h	m
1	I Sh. c.	0	24	8	II E. c.	20	20.0	16	I Em.	4	09	24	I Sh. c.	0	34
	I Tr. c.	1	15		I E. c.	23	34.3		I Sh. c.	22	40		I Tr. c.	0	57
	I Sh. f.	2	33						I Tr. c.	23	12		I Sh. f.	2	44
	I Tr. f.	3	23										I Tr. f.	3	06
	II E. c.	17	44.1	9	II Em.	0	10	17	I Sh. f.	0	50	24	III Sh. c.	17	39
	I E. c.	21	41.1		I Em.	2	25		I Tr. f.	1	21		III Tr. c.	19	22
	II Em.	21	50		I Sh. c.	20	46		III Sh. c.	13	41		III Sh. f.	19	32
2	I Em.	0	39		I Tr. c.	21	27		III Sh. f.	15	33		III Sh. c.	20	19
	I Sh. c.	18	52		I Sh. f.	22	56		III Tr. c.	16	02		III Tr. f.	20	43
	I Tr. c.	19	41		I Tr. f.	23	36		III Tr. f.	17	23		II Tr. c.	21	04
	I Sh. f.	21	02	10	III Sh. c.	9	43		II Sh. c.	17	46		I E. c.	21	49.3
	I Tr. f.	21	50		III Sh. f.	11	35		II Tr. c.	18	49		II Sh. f.	22	44
3	III Sh. c.	5	45		III Tr. c.	12	40		I E. c.	19	55.9	25	II Tr. f.	23	23
	III Sh. f.	7	38		III Tr. f.	14	00		II Sh. f.	20	10		I Em.	0	19
	III Tr. c.	9	15		II Sh. c.	15	13		I Em.	22	35		I Sh. c.	19	02
	III Tr. f.	10	36		II Tr. c.	16	33		I Sh. c.	17	08		I Tr. c.	19	23
	II Sh. c.	12	40		II Sh. f.	17	37	18	I Sh. f.	19	18		I Sh. f.	21	12
	II Tr. c.	14	16		I E. c.	18	02.6		I Tr. f.	19	47		I Tr. f.	21	32
	II Sh. f.	15	04		II Tr. f.	18	53		II E. c.	12	14.6	26	II E. c.	14	50.9
	I E. c.	16	09.4		I Em.	20	51		I E. c.	14	24.3		I E. c.	16	17.7
	II Tr. f.	16	35	11	I Sh. c.	15	14		II Em.	15	37		II Em.	17	54
	I Em.	19	06		I Tr. c.	15	54		I Em.	17	01		I Em.	18	45
4	I Sh. c.	13	20		I Sh. f.	17	24	19				27	I Sh. c.	13	31
	I Tr. c.	14	08		I Tr. f.	18	02						I Tr. c.	13	49
	I Sh. f.	15	30	12	II E. c.	9	38.5						I Sh. f.	15	41
	I Tr. f.	16	16		I E. c.	12	30.9						I Tr. f.	15	58
5	II E. c.	7	02.5		II Em.	13	19	20	I Sh. c.	11	37	28	III E. c.	7	38.7
	I E. c.	10	37.7		I Em.	15	17		I Tr. c.	12	05		II Sh. c.	9	36
	II Em.	11	00	13	I Sh. c.	9	43		I Sh. f.	13	47		II Tr. c.	10	11
	I Em.	13	32		I Tr. c.	10	20		I Tr. f.	14	13		III Em.	10	25
6	I Sh. c.	7	49		I Sh. f.	11	53	21	III E. c.	3	41.1		I E. c.	10	46.1
	I Tr. c.	8	34		I Tr. f.	12	28		III E. f.	5	34.9	29	II Sh. f.	12	01
	I Sh. f.	9	59		III E. c.	23	43.1		III E. f.	5	44		II Tr. f.	12	30
	I Tr. f.	10	43		III E. f.	1	36.7		III Im.	5	44		I Em.	13	11
	III E. c.	19	45.4		III Im.	2	24		III Sh. c.	7	03	30	I Sh. c.	7	59
	III E. f.	21	38.9		III Em.	3	45		III Em.	7	06		I Tr. c.	8	15
	III Im.	23	00		II Sh. c.	4	30		II Tr. c.	7	57		I Tr. f.	10	09
7	III Em.	0	22		II Tr. c.	5	41		I E. c.	8	52.6		I Tr. f.	10	24
	II Sh. c.	1	56		II Sh. f.	6	54		II Sh. f.	9	27				
	II Tr. c.	3	25		I E. c.	6	59.3		II Tr. f.	10	16				
	II Sh. f.	4	21		II Tr. f.	8	01		I Em.	11	27				
	I E. c.	5	06.0		I Em.	9	43	22	I Sh. c.	6	05				
	II Tr. f.	5	44	15	I Sh. c.	4	11		I Tr. c.	6	31	29			
	I Em.	7	58		I Tr. c.	4	46		I Sh. f.	8	15				
8	I Sh. c.	2	17		I Sh. f.	6	21		I Tr. f.	8	39	30			
	I Tr. c.	3	01		I Tr. f.	6	55								
	I Sh. f.	4	27		II E. c.	22	56.1	23	II E. c.	1	32.3				
	I Tr. f.	5	09		I E. c.	1	27.6		I E. c.	3	21.0				
					II Em.	2	28		II Em.	4	45				
									I Em.	5	53				
I				II				III				IV			
Apr. 1, $x_1 = -1.7$; $y_1 = -0.3$				Apr. 1, $x_1 = -2.0$; $y_1 = -0.3$				Apr. 13, $x_1 = -1.8$; $y_1 = -0.9$				No eclipse			
Apr. 16, $x_1 = -1.4$; $y_1 = -0.3$				Apr. 15, $x_1 = -1.6$; $y_1 = -0.5$				Apr. 14, $x_1 = -0.8$; $y_1 = -0.9$							
Eclipse commences ... E. c.				Transit commences ... Tr. c.											
Eclipse finishes ... E. f.				Transit finishes ... Tr. f.											
Occultation, immersion ... Im.				Shadow commences ... Sh. c.											
Occultation, emersion ... Em.				Shadow finishes ... Sh. f.											

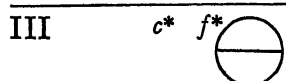
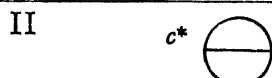
SATELLITES OF JUPITER, 1935

607

APRIL

Configurations at 1 ^h 15 ^m			
Day	West		East
1		2	3 4 1
2		1 2 4 3	
3		1 4 3 2	
4		4 3 2 1	
5		4 3 1 2	
6		4 3 1 2	
7		4 1 3 2	
8		4 2 1 3	
9	1	4 2 3	
10		4 1 3 2	
11		2 3 4 1	
12		3 2 1 4	
13		3 1 2 4	
14		1 3 2 4	
15		2 1 3 4	
16	2	1 3 4	
17	1	3 2 4	
18		2 3 1 4	
19		3 2 1 4	
20		3 4 2 1	
21		4 1 3 2	
22		4 2 1 3	
23		4 1 2 3	
24		4 2 3 1	
25		4 3 2 1	
26		4 3 2 1	
27		3 4 2 1	
28		1 3 4 2	
29		2 1 3 4	
30		2 1 3 4	

PHASES OF THE ECLIPSES



IV
No eclipse of this Satellite

SATELLITES OF JUPITER, 1935

MAY




Day		h^m	Day		h^m	Day		h^m	Day		h^m
1	I Sh. c.	2 28	9	II Sh. c.	1 26	16	III Sh. c.	5 34	24	I Tr. c.	2 20 ^m
	I Tr. c.	2 41		II Tr. c.	1 31		I E. f.	5 39.8		I Sh. c.	2 39
	I Sh. f.	4 38		III Sh. c.	1 36		II Tr. f.	6 05		I Tr. f.	4 29
	I Tr. f.	4 50		I E. c.	1 36.5		II Sh. f.	6 25		I Sh. f.	4 50
	III Sh. c.	21 37		III Tr. c.	1 55		III Tr. f.	6 38		I Im.	23 32
	III Tr. c.	22 40		III Tr. f.	3 20		III Sh. f.	7 28			
	I Sh. c.	22 53		III Sh. f.	3 29						
	II Tr. c.	23 18		I Em.	3 47	17	I Tr. c.	0 35	25	II Im.	0 36
	III Sh. f.	23 31		II Sh. f.	3 51		I Sh. c.	0 45		I E. f.	2 02.2
	I E. c.	23 42.9		II Tr. f.	3 51		I Tr. f.	2 44		II E. f.	3 45.0
				I Sh. c.	22 50		I Sh. f.	2 55		I Tr. c.	20 46
				I Tr. c.	22 51		I Im.	21 48		I Sh. c.	21 08
							II Im.	22 20		I Tr. f.	22 55
										I Sh. f.	23 18
2	III Tr. f.	0 02		I Tr. f.	1 00	18	I E. f.	0 08.3	26	I Im.	17 58
	II Sh. f.	1 17		I Sh. f.	1 01		II E. f.	1 08.0		II Tr. c.	19 06
	II Tr. f.	1 37		I Im.	20 04		I Tr. c.	19 01		II Sh. c.	19 50
	I Em.	2 03		II E. c.	20 04.0		I Sh. c.	19 14		I E. f.	20 30.7
	I Sh. c.	20 56		II Im.	20 04		I Tr. f.	21 10		II Tr. f.	21 26
	I Tr. c.	21 07		I E. f.	22 14.5		I Sh. f.	21 24		III Im.	22 04
	I Sh. f.	23 06		II E. f.	22 31.1					II Sh. f.	22 16
	I Tr. f.	23 16									
3	II E. c.	17 27.4		I Tr. c.	17 17	19	I Im.	16 14	27	III E. f.	1 25.5
	I E. c.	18 11.3		I Sh. c.	17 19		II Tr. c.	16 51		I Tr. c.	15 12
	II Em.	20 10		I Tr. f.	19 26		II Sh. c.	17 16		I Sh. c.	15 37
	I Em.	20 29		I Sh. f.	19 29		I E. f.	18 36.8		I Tr. f.	17 21
							III Im.	18 47		I Sh. f.	17 47
4	I Sh. c.	15 25		I Im.	14 30		II Tr. f.	19 12			
	I Tr. c.	15 33		II Tr. c.	14 38		II Sh. f.	19 42			
	I Sh. f.	17 35		II Sh. c.	14 43		III E. f.	21 26.5			
	I Tr. f.	17 42		III Im.	15 32						
				I E. f.	16 42.9	20	I Tr. c.	13 27	28	I Im.	12 24
				II Tr. f.	16 58		I Sh. c.	13 42		II Im.	13 44
				II Sh. f.	17 08		I Tr. f.	15 36		I E. f.	14 59.2
				III E. f.	17 28.4		I Sh. f.	15 52		II E. f.	17 03.1
5	III E. c.	11 36.2		I Tr. c.	11 43	21	I Im.	10 40	29	I Tr. c.	9 38
	II Sh. c.	12 09		I Sh. c.	11 47		II Im.	11 27		I Sh. c.	10 05
	II Tr. c.	12 24		I Tr. f.	13 52		I E. f.	13 05.2		I Tr. f.	11 48
	I E. c.	12 39.7		I Sh. f.	13 58		II E. f.	14 26.0		I Sh. f.	12 16
	III Em.	13 42									
	II Sh. f.	14 34									
	II Tr. f.	14 44									
	I Em.	14 55									
6	I Sh. c.	9 53		I Im.	8 56	22	I Tr. c.	7 54	30	I Im.	6 50
	I Tr. c.	9 59		II Im.	9 11		I Sh. c.	8 11		II Tr. c.	8 13
	I Sh. f.	12 04		I E. f.	11 11.3		I Tr. f.	10 03		II Sh. c.	9 07
	I Tr. f.	12 08		II E. f.	11 49.1		I Sh. f.	10 21		I E. f.	9 27.8
										II Tr. f.	10 34
7	II E. c.	6 45.2		I Tr. c.	6 09	23	I Im.	5 06		II Sh. f.	11 33
	I E. c.	7 08.1		I Sh. c.	6 16		II Tr. c.	5 58		III Tr. c.	11 44
	II Em.	9 18		I Tr. f.	8 18		II Sh. c.	6 33		III Tr. f.	13 18
	I Em.	9 21		I Sh. f.	8 27		I E. f.	7 33.7		III Sh. c.	13 30
							II Tr. f.	8 19		III Sh. f.	15 25
							III Tr. c.	8 26			
8	I Sh. c.	4 22		I Im.	3 22		II Sh. f.	8 59	31	I Tr. c.	4 05
	I Tr. c.	4 25		II Tr. c.	3 44		III Sh. c.	9 32		I Sh. c.	4 34
	I Sh. f.	6 32		II Sh. c.	4 00		III Tr. f.	9 57		I Tr. f.	6 14
	I Tr. f.	6 34		III Tr. c.	5 11		III Sh. f.	11 26		I Sh. f.	6 44
I			II			III			IV		
May 1, $x_1 = -1.1$; $y_1 = -0.3$			May 3, $x_1 = -1.0$; $y_1 = -0.5$			May 12, $x_2 = +0.7$; $y_2 = -0.9$			No eclipse		
May 16, $x_2 = +1.1$; $y_2 = -0.3$			May 14, $x_2 = +1.0$; $y_2 = -0.5$								
Eclipse commences ... E. c.			Transit commences ... Tr. c.								
Eclipse finishes ... E. f.			Transit finishes ... Tr. f.								
Occultation, immersion ... Im.			Shadow commences ... Sh. c.								
Occultation, emersion ... Em.			Shadow finishes ... Sh. f.								

MAY

Configurations at 23^h 45^m

Day	West	East
1	3 ○	○ 1 4 2 ○
2	3 2 1 ○	4
3	3 2 1 ○	4
4	3 1 ○	2 4
5	2 ○ 4 3 1	
6	4 2 1 ○	3
7	4 ○ 1 2 3	
8	4 1 2 3 ○	
9	4 2 3 ○	1 ○
10	4 3 ○ 2 1	
11	4 3 1 ○	2
12	4 2 ○ 3 1	
13	2 4 1 ○	3
14	○ 1 4 2 3	
15	1 ○ 2 3 4	
16	2 3 1 ○	4
17	3 ○	4 ● 2 ● 1
18	3 1 ○	2 4
19	2 ○ 3 1 4	
20	2 1 ○	3 4
21	○ 1 4 3	
22	1 4 ○ 2 3	
23	4 2 3 ○ 1	
24	● 1 4 3 ○ 2	
25	4 3 1 ○	2
26	4 2 ○ 1 ● 3	
27	4 2 1 ○	3
28	4 ○ 2 1 3	
29	4 1 ○ 2 3	
30	2 3 ○ 4 1	
31	3 2 1 ○	4

PHASES OF THE ECLIPSES

I		II	
III		IV	No eclipse of this Satellite

JUNE

Day		h^m	Day		h^m	Day		h^m	Day		h^m
1	I Im.	1 16	8	I E. f.	5 50.5	16	I Tr. c.	2 04	23	I Tr. f.	6 01 ^m
	II Im.	2 53		II E. f.	8 59.3		I Sh. c.	2 53		I Sh. f.	6 57
	I E. f.	3 56.3					I Tr. f.	4 13			
	II E. f.	6 22.1					I Sh. f.	5 02			
	I Tr. c.	22 31	9	I Tr. c.	0 17		I Im.	23 15	24	I Im.	1 02
	I Sh. c.	23 03		I Sh. c.	0 58					I E. f.	4 07.8
2	I Tr. f.	0 40		I Tr. f.	2 26	17	II Tr. c.	1 56		II Tr. c.	4 17
	I Sh. f.	1 13		I Sh. f.	3 08		I E. f.	2 13.4		II Sh. c.	6 07
	I Im.	19 43		I Im.	21 28		II Sh. c.	3 33		II Tr. f.	6 40
	II Tr. c.	21 21		II Tr. c.	23 38		II Tr. f.	4 19		II Sh. f.	8 33
	II Sh. c.	22 24	10	I E. f.	0 19.0		II Sh. f.	5 58		III Im.	11 36
	I E. f.	22 24.8		II Sh. c.	0 58		III Im.	8 08		III Em.	13 26
	II Tr. f.	23 42		II Tr. f.	2 00		III Em.	9 54		III E. c.	15 24.5
3	II Sh. f.	0 50		III Im.	4 43		III E. c.	11 26.2		III E. f.	17 21.0
	III Im.	1 22		III Em.	6 25		I Tr. c.	13 22.3		I Tr. c.	22 19
	III Em.	3 00		III E. c.	7 27.8		I Sh. c.	20 31	25	I Sh. c.	23 16
	III E. c.	3 29.0		III E. f.	9 23.5		I Tr. f.	21 21		I Tr. f.	0 28
	III E. f.	5 24.3		I Tr. c.	18 44		I Sh. c.	21 21		I Sh. f.	1 25
	I Tr. c.	16 58		I Sh. c.	19 26		I Tr. f.	22 40		I Im.	19 29
	I Sh. c.	17 32		I Tr. f.	20 53	18	I Im.	17 41		I E. f.	22 36.4
	I Tr. f.	19 07		I Sh. f.	21 36		I E. f.	20 42.0		II Im.	23 06
	I Sh. f.	19 42					II Im.	20 42	26	II E. f.	3 31.9
4	I Im.	14 09	11	I Im.	15 55	19	II E. f.	0 54.6		I Tr. c.	16 46
	II Im.	16 02		II Im.	18 21		I Tr. c.	14 58		I Sh. c.	17 45
	I E. f.	16 53.4		I E. f.	18 47.6		I Sh. c.	15 50		I Tr. f.	18 56
	II E. f.	19 40.2		II E. f.	22 17.3		I Tr. f.	17 07		I Sh. f.	19 55
			12	I Tr. c.	13 10		I Sh. f.	18 00	27	I Im.	13 56
5	I Tr. c.	11 24		I Sh. c.	13 55	20	I Im.	12 08		I E. f.	17 05.1
	I Sh. c.	12 00		I Tr. f.	15 20		II Tr. c.	15 06		II Tr. c.	17 28
	I Tr. f.	13 33		I Sh. f.	16 05		I E. f.	15 10.6		II Sh. c.	19 25
	I Sh. f.	14 10					II Sh. c.	16 50		II Tr. f.	19 51
6	I Im.	8 35	13	I Im.	10 21		II Tr. f.	17 29		II Sh. f.	21 50
	II Tr. c.	10 29		II Tr. c.	12 47		II Sh. f.	19 15	28	III Tr. c.	1 26
	I E. f.	11 21.9		I E. f.	13 16.1		III Tr. c.	21 55		III Tr. f.	3 16
	II Sh. c.	11 41		II Sh. c.	14 16		III Tr. f.	23 41		III Sh. c.	5 27
	II Tr. f.	12 51		II Sh. f.	15 09					III Sh. f.	7 22
	II Sh. f.	14 07		III Tr. c.	18 27	21	III Sh. c.	1 28		I Tr. c.	11 14
	III Tr. c.	15 04		III Tr. f.	20 09		III Sh. f.	3 23		I Sh. c.	12 14
	III Tr. f.	16 42		III Sh. c.	21 28		I Tr. c.	9 25		I Tr. f.	13 23
	III Sh. c.	17 29		III Sh. f.	23 23		I Sh. c.	10 19		I Sh. f.	14 23
	III Sh. f.	19 23					I Tr. f.	11 34	29	I Im.	8 23
			14	I Tr. c.	7 37		I Sh. f.	12 28		I E. f.	11 33.7
7	I Tr. c.	5 51		I Sh. c.	8 24	22	I Im.	6 35		II Im.	12 19
	I Sh. c.	6 29		I Tr. f.	9 46		I E. f.	9 39.2		II E. f.	16 50.9
	I Tr. f.	8 00		I Sh. f.	10 34		II Im.	9 54			
	I Sh. f.	8 39					II E. f.	14 13.6	30	I Tr. c.	5 41
8	I Im.	3 02	15	I Im.	4 48	23	I Tr. c.	3 52		I Sh. c.	6 43
	II Im.	5 12		II Im.	7 32		I Sh. c.	4 48		I Tr. f.	7 50
				I E. f.	7 44.8					I Sh. f.	8 52
				II E. f.	11 36.4						

I
June 1, $x_2 = +1.4$; $y_2 = -0.3$
June 15, $x_2 = +1.6$; $y_2 = -0.3$

II
June 1, $x_2 = +1.5$; $y_2 = -0.3$
June 15, $x_2 = +1.9$; $y_2 = -0.5$

III
June 17, $x_2 = +1.3$; $y_2 = -0.8$
June 17, $x_2 = +2.4$; $y_2 = -0.8$

IV
No eclipse

Eclipse commences ... E. c.
Eclipse finishes ... E. f.
Occultation, immersion ... Im.
Occultation, emersion ... Em.

Transit commences ... Tr. c.
Transit finishes ... Tr. f.
Shadow commences ... Sh. c.
Shadow finishes ... Sh. f.



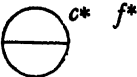
SATELLITES OF JUPITER, 1935

611

JUNE

Configurations at 22 ^h 30 ^m			
Day	West		East
1	'3	1 ○	'2 '4
2		'3 ○ '1	'4 2 ○
3	'2 '1	○	'3 '4
4		○	'2 '1 '3 '4
5	'1	○	'2 '3 '4
6	'2 '3	○	'1 '4
7	'3 '2	○	'1 '4
8	'3 '4	○ '1	'2
9	● '1 '4	'3 2 ○	
10	'4 '2	'1 ○	'3
11	'4	○ '2 '1	'3
12	'4	'1 ○	'2 '3
13	'4	'2 '3 ○	'1
14	'4 '3	'2 '1 ○	
15	'3 '4	○ '1	'2
16		'3 '1 ○ '4	'2
17	'1 ○	'2	○ '3 '4
18		○ '1	'3 '4 ● '2
19		'1 ○	'2 '3 '4
20		'2 ○	'1 '4 3 ○
21	'3 '2 '1	○	'4
22	'3	○ '1	'2 '4
23	'3 '1	○	'2 '4
24	'2	'4 ○	'3 '1 ○
25	'4	'1 ○ '2	'3
26	'4	'1 ○	'2 '3
27	'4	'2 ○ '3	'1
28	'4	'3 '2 '1	○
29	'4	'3	○ '2 '1
30	'4	'3 '1 ○	'2

PHASES OF THE ECLIPSES

I		II	
III		IV	No eclipse of this Satellite

JULY

Day		h^m	Day		h^m	Day		h^m	Day		h^m
1	I Im.	2 50	8	III Im.	18 46	16	I Sh. c.	5 02	24	I Im.	2 51
	I E. f.	6 02.4		III Em.	20 42		III E. f.	5 18.9		I E. f.	6 15.3
	II Tr. c.	6 39		III E. c.	23 21.7		I Tr. f.	6 00		II Im.	9 00
	II Sh. c.	8 42					I Sh. f.	7 11		II E. f.	14 00.3
	II Tr. f.	9 03	9	III E. f.	1 19.0	17	I Im.	0 59	25	I Tr. c.	0 11
	II Sh. f.	11 07		I Tr. c.	1 59		I E. f.	4 20.4		I Sh. c.	1 26
	III Im.	15 09		I Sh. c.	3 06		II Im.	6 28		I Tr. f.	2 21
	III Em.	17 02		I Tr. f.	4 08		II E. f.	11 23.3		I Sh. f.	3 35
	III E. c.	19 23.0		I Sh. f.	5 16		I Tr. c.	22 18		I Im.	21 19
	III E. f.	21 20.0		I Im.	23 08		I Sh. c.	23 30			
2	I Tr. c.	0 08	10	I E. f.	2 25.7	18	I Tr. f.	0 28	26	I E. f.	0 44.0
	I Sh. c.	1 11		II Im.	3 58		I Sh. f.	1 40		II Tr. c.	3 16
	I Tr. f.	2 18		II E. f.	8 46.2		I Im.	19 27		II Tr. f.	5 42
	I Sh. f.	3 21		I Tr. c.	20 26		I E. f.	22 49.1		II Sh. c.	5 45
	I Im.	21 18		I Sh. c.	21 35					II Sh. f.	8 11
3	I E. f.	0 31.0		I Tr. f.	22 36	19	II Tr. c.	0 46		III Tr. c.	16 15
	II Im.	1 31		I Sh. f.	23 45		II Sh. c.	3 09		III Tr. f.	18 17
	II E. f.	6 09.1	11	I Im.	17 35		II Sh. c.	3 11		I Tr. c.	18 39
	I Tr. c.	18 36		I E. f.	20 54.4		II Sh. f.	5 35		I Sh. c.	19 54
	I Sh. c.	19 40		II Tr. c.	22 18		III Tr. c.	12 26		I Tr. f.	20 49
	I Tr. f.	20 45					III Tr. f.	14 25		III Sh. c.	21 22
	I Sh. f.	21 50		II Sh. c.	0 34		III Tr. f.	16 46		I Sh. f.	22 03
4	I Im.	15 45	12	II Tr. f.	0 42		I Tr. c.	17 23	27	I Im.	15 47
	I E. f.	18 59.7		II Sh. f.	3 00		III Sh. c.	17 59		I E. f.	19 12.7
	II Tr. c.	19 52		III Tr. c.	8 42		I Sh. c.	18 56		II Im.	22 17
	II Sh. c.	21 59		III Tr. f.	10 38		I Tr. f.	19 19			
	II Tr. f.	22 16		III Sh. c.	13 24	20	I Sh. f.	20 08	28	II E. f.	3 19.0
5	II Sh. f.	0 25		I Tr. c.	14 54		I Im.	13 55		I Tr. c.	13 08
	III Tr. c.	5 02		III Sh. f.	15 20		I E. f.	17 17.9		I Sh. c.	14 23
	III Tr. f.	6 55		I Sh. c.	16 04		II Im.	19 44		I Tr. f.	15 17
	III Sh. c.	9 26		I Tr. f.	17 04	21				I Sh. f.	16 32
	III Sh. f.	11 21		I Sh. f.	18 13		II E. f.	0 42.1	29	I Im.	10 15
	I Tr. c.	13 03	13	I Im.	12 03		I Tr. c.	11 14		I E. f.	13 41.4
	I Sh. c.	14 09		I E. f.	15 23.1		I Sh. c.	12 28		II Tr. c.	16 32
	I Tr. f.	15 13		II Im.	17 13		I Tr. f.	13 24		II Tr. f.	18 58
	I Sh. f.	16 18		II E. f.	22 05.1		I Sh. f.	14 37		II Sh. c.	19 02
6	I Im.	10 12	14	I Tr. c.	9 22	22	I Im.	8 23	30	III Im.	6 08
	I E. f.	13 28.4		I Sh. c.	10 33		I E. f.	11 46.5		I Tr. c.	7 36
	II Im.	14 45		I Tr. f.	11 32		II Tr. c.	14 01		III Em.	8 12
	II E. f.	19 28.0		I Sh. f.	12 42		II Sh. c.	16 27		I Sh. c.	8 52
7	I Tr. c.	7 31	15	I Im.	6 31		II Sh. f.	18 53		I Tr. f.	9 46
	I Sh. c.	8 38		I E. f.	9 51.8	23	III Im.	2 16		I Sh. f.	11 01
	I Tr. f.	9 40		II Tr. c.	11 31		III Em.	4 18		III E. c.	11 19.5
	I Sh. f.	10 47		II Sh. c.	13 52		I Tr. c.	5 43		III E. f.	13 18.4
8	I Im.	4 40		II Tr. f.	13 56		I Sh. c.	6 57			
	I E. f.	7 57.0		II Sh. f.	16 17		III E. c.	7 20.2	31	I Im.	4 44
	II Tr. c.	9 04		III Im.	22 29		I Tr. f.	7 52		I E. f.	8 10.2
	II Sh. c.	11 17	16	III Em.	0 27		I Sh. f.	9 06		II Im.	11 34
	II Tr. f.	11 29		III E. c.	3 21.2		III E. f.	9 18.5		II E. f.	16 37.1
	II Sh. f.	13 42		I Tr. c.	3 50						
I			II			III			IV		
July 1, $x_1 = +1.8$; $y_1 = -0.3$			July 3, $x_2 = +2.3$; $y_2 = -0.5$			July 16, $x_1 = +2.1$; $y_1 = -0.8$			No eclipse		
July 15, $x_2 = +2.0$; $y_2 = -0.3$			July 13, $x_2 = +2.5$; $y_2 = -0.5$			July 16, $x_2 = +3.2$; $y_2 = -0.8$					
Eclipse commences ... E. c.			Transit commences ... Tr. c.								
Eclipse finishes ... E. f.			Transit finishes ... Tr. f.								
Occultation, immersion ... Im.			Shadow commences ... Sh. c.								
Occultation, emersion ... Em.			Shadow finishes ... Sh. f.								

SATELLITES OF JUPITER, 1935




613

JULY

Configurations at 21^h 30^m

Day	West	East
1	'4 2'	○ ³ ₁
2	● 1	'4 ² ₂ ○ ³
3		1' ○ ⁴ ² ³
4	'2 ○	○ ¹ ₃ ⁴
5		'2 ³ 1' ○ ⁴
6		3' ○ ² ¹ ⁴
7		'3 ¹ ○ ² ⁴
8		2' ○ ³ 1' ⁴
9		'2 ¹ ○ ³ ⁴
10		○ ² ³ 1' ○
11		'4 ² ¹ ○ ³
12		4' ² ³ 1' ○
13		4' ³ ○ ² ¹
14		4' ³ ¹ ○ ²
15		'4 2' ¹ ○ ³ 1'
16		'4 ² ¹ ○ ³
17		'4 1' ○ ² ³
18		'4 ○ ² ³ ● ¹
19		2' ³ ¹ ○ ⁴
20		3' ○ ¹ ⁴ ● ²
21		'3 1' ○ ² ⁴
22		2' ³ ○ ¹ ⁴
23		'2 ¹ ○ ³ ⁴
24		○ 1' ² ³ ⁴
25	● 1	○ ² ³ ⁴
26		2' ³ ¹ ○ ⁴
27		3' ¹ ○ ² ⁴
28		'3 ¹ ⁴ ○ ²
29		4' ³ ² ○ ¹
30		4' ² ¹ ○ ³
31		4' ○ ¹ ² ³

PHASES OF THE ECLIPSES

I	 f*	II	 f*
III	 c* f*	IV	No eclipse of this Satellite

AUGUST

Day		^h _m	Day		^h _m	Day		^h _m	Day		^h _m
1	I Tr. c.	2 05	9	I Im.	1 07	16	II Sh. c.	13 31	24	I Sh. f.	5 44
	I Sh. c.	3 21		I E. f.	4 33.8		II Sh. f.	15 58		III Tr. c.	8 15
	I Tr. f.	4 14		II Tr. c.	8 23					III Tr. f.	10 24
	I Sh. f.	5 30		II Tr. f.	10 50	17	I Tr. c.	0 24		III Sh. c.	13 19
	I Im.	23 12		II Sh. c.	10 55		I Sh. c.	1 40		III Sh. f.	15 18
2	I E. f.	2 38.8		II Sh. f.	13 22		I Tr. f.	2 34		I Im.	23 28
	II Tr. c.	5 49		I Tr. c.	22 28		I Sh. f.	3 49			
	II Tr. f.	8 15		I Sh. c.	23 45		III Tr. c.	4 09	25	I E. f.	2 52.6
	II Sh. c.	8 20	10	III Tr. c.	0 08		III Tr. f.	6 17		II Im.	8 47
	II Sh. f.	10 46		I Tr. f.	0 38		III Sh. c.	9 20		II E. f.	13 45.2
	III Tr. c.	20 09		I Sh. f.	1 54		III Sh. f.	11 18		I Tr. c.	20 50
	I Tr. c.	20 33		III Tr. f.	2 13	18	I Im.	21 31		I Sh. c.	22 04
	I Sh. c.	21 49		III Sh. c.	5 21		I E. f.	0 57.5		I Tr. f.	23 00
	III Tr. f.	22 13		III Sh. f.	7 19		II Im.	6 07	26	I Sh. f.	0 13
	I Tr. f.	22 43		I Im.	19 36		II E. f.	11 08.9		I Im.	17 57
	I Sh. f.	23 58		I E. f.	23 02.6		I Tr. c.	18 53		I E. f.	21 21.3
3	III Sh. c.	1 21	11	II Im.	3 28		I Sh. c.	20 08	27	II Tr. c.	2 59
	III Sh. f.	3 18		II E. f.	8 32.4		I Tr. f.	21 03		II Sh. c.	5 25
	I Im.	17 41		I Tr. c.	16 57		I Sh. f.	22 17		II Tr. f.	5 27
	I E. f.	21 07.6		I Sh. c.	18 13	19	I Im.	16 00		II Sh. f.	7 52
4	II Im.	0 52		I Tr. f.	19 07		I E. f.	19 26.3		I Tr. c.	15 19
	II E. f.	5 55.8		I Sh. f.	20 22					I Sh. c.	16 32
	I Tr. c.	15 02	12	I Im.	14 04	20	II Tr. c.	0 19		I Tr. f.	17 29
	I Sh. c.	16 18		I E. f.	17 31.3		II Tr. f.	2 47		I Sh. f.	18 41
	I Tr. f.	17 12		II Tr. c.	21 41		II Sh. c.	2 49		III Im.	22 13
	I Sh. f.	18 27					II Sh. f.	5 16	28	III Em.	0 27
5	I Im.	12 09	13	II Tr. f.	0 09		I Tr. c.	13 22		III E. c.	3 14.8
	I E. f.	15 36.3		II Sh. c.	0 13		I Sh. c.	14 37		III E. f.	5 15.9
	II Tr. c.	19 06		II Sh. f.	2 40		I Tr. f.	15 32		I Im.	12 27
	II Tr. f.	21 32		I Tr. c.	11 26		I Sh. f.	16 46		I E. f.	15 50.1
	II Sh. c.	21 38		I Sh. c.	12 42		III Im.	18 06		II Im.	22 07
				I Tr. f.	13 36		III Em.	20 16			
6	II Sh. f.	0 04		III Im.	14 03	21	III E. c.	23 15.9			
	I Tr. c.	9 31		I Sh. f.	14 51		III E. f.	1 16.5	29	II E. f.	3 03.2
	III Im.	10 03		III Em.	16 11		I Im.	10 30		I Tr. c.	9 49
	I Sh. c.	10 47		III E. c.	19 17.0		I E. f.	13 55.0		I Sh. c.	11 01
	I Tr. f.	11 40		III E. f.	21 17.0		II Im.	19 26		I Tr. f.	11 59
	III Em.	12 10	14	I Im.	8 33	22	II E. f.	0 26.9		I Sh. f.	13 10
	I Sh. f.	12 56		I E. f.	12 00.0		I Tr. c.	7 52	30	I Im.	6 56
	III E. c.	15 18.4		II Im.	16 47		I Sh. c.	9 06		I E. f.	10 18.8
	III E. f.	17 17.7		II E. f.	21 50.5		I Tr. f.	10 02		II Tr. c.	16 19
							I Sh. f.	11 15		II Sh. c.	18 43
7	I Im.	6 38	15	I Tr. c.	5 55	23	I Im.	4 59		II Tr. f.	18 47
	I E. f.	10 05.1		I Sh. c.	7 11		I E. f.	8 23.8		II Sh. f.	21 11
	II Im.	14 09		I Tr. f.	8 05		II Tr. c.	13 39	31	I Tr. c.	4 18
	II E. f.	19 13.9		I Sh. f.	9 20		II Sh. c.	16 07		I Sh. c.	5 30
8	I Tr. c.	4 00	16	I Im.	3 02		II Tr. f.	16 07		I Tr. f.	6 28
	I Sh. c.	5 16		I E. f.	6 28.8		II Sh. f.	18 34		I Sh. f.	7 39
	I Tr. f.	6 09		II Tr. c.	11 00	24	I Tr. c.	2 21		III Tr. c.	12 23
	I Sh. f.	7 25		II Tr. f.	13 28		I Sh. c.	3 35		III Tr. f.	14 33
							I Tr. f.	4 31		III Sh. c.	17 17
										III Sh. f.	19 17

I
Aug. 2, $x_2 = +2.0$; $y_2 = -0.3$
Aug. 16, $x_2 = +2.0$; $y_2 = -0.3$

II
Aug. 4, $x_4 = +2.6$; $y_4 = -0.5$
Aug. 14, $x_4 = +2.5$; $y_4 = -0.5$

III
Aug. 13, $x_3 = +2.3$; $y_3 = -0.7$
Aug. 13, $x_3 = +3.3$; $y_3 = -0.7$

IV
No eclipse

Eclipse commences ... E. c.
Eclipse finishes ... E. f.
Occultation, immersion ... Im.
Occultation, emersion ... Em.

Transit commences ... Tr. c.
Transit finishes ... Tr. f.
Shadow commences ... Sh. c.
Shadow finishes ... Sh. f.

SATELLITES OF JUPITER, 1935

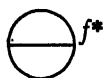
615

AUGUST

Configurations at 20 ^h 00 ^m			
Day	West		East
1	4	1 0	2 3
2	4	2 1 0	3 0
3	4 3	2 0 1	
4	3 4 1	0	2
5	3	0 4 1	2 0
6	2 1	0	3 4
7		0	2 1 3 4
8		1 0	2 3 4
9		2 0 1 3	4
10	1 0	3 2 0	4
11		3 1 0	2 4
12		3 0 2 1	4
13		2 1 0	3 4
14		4 0 2 1	3
15		4 1 0	2 3
16	4	2 0 1 3	
17	4	3 2 1 0	
18	1 0	4 3 0	2
19		4 3 0 1 2	
20		4 2 1 0	3 0
21	1 0	4 0 1 3	
22		1 0 4 2 3	
23		2 0 1 3 4	
24		2 3 1 0	4
25		3 1 0 2	4
26		3 0 2 4	1 0
27		2 1 0 3	4
28		2 0 1 3 4	
29		1 0 2 4 3	
30		2 0 1 3	
31		2 1 4 3 0	

PHASES OF THE ECLIPSES

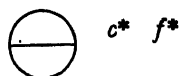
I



II



III



IV

No eclipse of this Satellite

SEPTEMBER

Day		^h ₁ ^m ₂	Day		^h ₁ ^m ₂	Day		^h ₁ ^m ₂	Day		^h ₁ ^m ₂
1	I Im.	1 25	8	II Im.	14 11	16	I Tr. c.	2 45	23	I Tr. f.	6 54 ^m
	I E. f.	4 47.6		II E. f.	18 57.4		I Sh. c.	3 48		I Sh. f.	7 52
	II Im.	11 28					I Tr. f.	4 55			
	II E. f.	16 21.4					I Sh. f.	5 57			
	I Tr. c.	22 48					I Im.	23 52			
	I Sh. c.	23 58									
2	I Tr. f.	0 58				17	I E. f.	3 06.3	24	I Im.	1 52
	I Sh. f.	2 08					II Tr. c.	11 06		I E. f.	5 01.3
	I Im.	19 55					II Sh. c.	13 13		II Tr. c.	13 52
	I E. f.	23 16.3					II Tr. f.	13 36		II Sh. c.	15 50
							II Sh. f.	15 42		II Tr. f.	16 22
							I Tr. c.	21 14		II Sh. f.	18 19
							I Sh. c.	22 17		I Tr. c.	23 14
							I Tr. f.	23 25			
3	II Tr. c.	5 40				18	I Sh. f.	0 26	25	I Sh. c.	0 12
	II Sh. c.	8 01					III Im.	10 54		I Tr. f.	1 24
	II Tr. f.	8 08					III Em.	13 08		I Sh. f.	2 21
	II Sh. f.	10 29					III E. c.	15 12.8		III Im.	15 12
	I Tr. c.	17 17					III E. f.	17 15.9		III Em.	17 27
	I Sh. c.	18 27					I Im.	18 22		III E. c.	19 11.5
	I Tr. f.	19 27					I E. f.	21 35.1		I Im.	20 22
	I Sh. f.	20 36								III E. f.	21 15.4
										I E. f.	23 30.1
4	III Im.	2 24				19	II Im.	6 17	26	II Im.	9 02
	III Em.	4 36					II E. f.	10 50.8		II E. f.	13 26.3
	III E. c.	7 14.4					I Tr. c.	15 44		I Tr. c.	17 44
	III E. f.	9 16.2					I Sh. c.	16 46		I Sh. c.	18 40
	I Im.	14 24					I Tr. f.	17 55		I Tr. f.	19 54
	I E. f.	17 45.1					I Sh. f.	18 55		I Sh. f.	20 50
5	II Im.	0 49				20	I Im.	12 52	27	I Im.	14 52
	II E. f.	5 39.3					I E. f.	16 03.8		I E. f.	17 58.8
	I Tr. c.	11 47									
	I Sh. c.	12 56									
	I Tr. f.	13 57									
	I Sh. f.	15 05									
6	I Im.	8 54				21	II Tr. c.	0 29	28	II Tr. c.	3 15
	I E. f.	12 13.8					II Sh. c.	2 32		II Sh. c.	5 08
	II Tr. c.	19 01					II Tr. f.	2 59		II Tr. f.	5 46
	II Sh. c.	21 19					II Sh. f.	5 01		II Sh. f.	7 37
	II Tr. f.	21 30					I Tr. c.	10 14		I Tr. c.	12 14
	II Sh. f.	23 47					I Sh. c.	11 14		I Sh. c.	13 09
							I Tr. f.	12 24		I Tr. f.	14 24
							I Sh. f.	13 24		I Sh. f.	15 18
7	I Tr. c.	6 16				22	III Tr. c.	1 06	29	III Tr. c.	5 26
	I Sh. c.	7 25					III Tr. f.	3 19		III Tr. f.	7 40
	I Tr. f.	8 26					III Sh. c.	5 14		III Sh. c.	9 13
	I Sh. f.	9 34					III Sh. f.	7 16		I Im.	9 22
	III Tr. c.	16 34					I Im.	7 22		III Sh. f.	11 16
	III Tr. f.	18 46					I E. f.	10 32.6		I E. f.	12 27.6
	III Sh. c.	21 16					II Im.	19 39		II Im.	22 25
	III Sh. f.	23 17									
8	I Im.	3 23				23	II E. f.	0 08.6	30	II E. f.	2 43.9
	I E. f.	6 42.6					I Tr. c.	4 44		I Tr. c.	6 44
							I Sh. c.	5 43		I Sh. c.	7 38
										I Tr. f.	8 54
										I Sh. f.	9 47

I

Sept. 1, $x_1 = +2.0$; $y_1 = -0.3$
Sept. 15, $x_2 = +1.9$; $y_2 = -0.3$

II

Sept. 1, $x_1 = +2.5$; $y_1 = -0.5$
Sept. 15, $x_2 = +2.3$; $y_2 = -0.5$

III

Sept. 11, $x_1 = +1.9$; $y_1 = -0.7$
Sept. 11, $x_2 = +3.0$; $y_2 = -0.7$

IV

No eclipse

Eclipse commences ... E. c.
 Eclipse finishes ... E. f.
 Occultation, immersion ... Im.
 Occultation, emersion ... Em.

Transit commences ... Tr. c.
 Transit finishes ... Tr. f.
 Shadow commences ... Sh. c.
 Shadow finishes ... Sh. f.

SATELLITES OF JUPITER, 1935

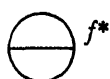
617

SEPTEMBER

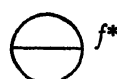
Configurations at 18 ^h 45 ^m		
Day	West	East
1	4° 3°	○ 1° 2°
2	4° 3°	1° ○ 2°
3	1° ○ 4°	2° 3° ○
4	4°	2° ○ 1° 3°
5	4°	1° ○ 2° 3°
6	4°	2° ○ 1° 3°
7	3° ○	2° 4° 1° ○
8	3°	○ 2° 4° 1°
9	3°	1° ○ 2° 4°
10		3° 2° 1° ○ 4°
11		2° ○ 1° 3° 4°
12		1° ○ 2° 3° 4°
13		○ 2° 1° 3° 4°
14		2° 1° 3° ○ 4°
15		3° ○ 1° 4° ● 2°
16		3° 1° 4° ○ 2°
17		4° 3° 2° ○ 1°
18	● 1°	4° 2° ○ 3°
19	4°	1° ○ 2° 3°
20	4°	○ 1° 2° 3°
21	4°	2° 1° ○ 3°
22	4°	3° 2° ○ 1°
23	3° 4°	1° ○ 2°
24	3°	4° 2° ○ 1°
25		2° 1° ○ 3° 4°
26		○ 2° 3° 4° 1° ○
27		○ 1° 2° 3° 4°
28		2° 1° ○ 3° 4°
29		3° 2° ○ 1° 4°
30	3°	1° ○ 2° 4°

PHASES OF THE ECLIPSES

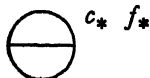
I



II



III



IV

No eclipse of this Satellite

OCTOBER


Day		^h _m	Day		^h _m	Day		^h _m	Day		^h _m
1	I Im.	3 52	5	II Tr. f.	8 34	9	I Tr. f.	5 24	13	I E. f.	16 17.5
	I E. f.	6 56.3		II Sh. f.	10 14		I Sh. f.	6 10		III Tr. f.	16 26
	II Tr. c.	16 38		I Tr. c.	14 14		III Im.	23 55		III Sh. c.	17 10
	II Sh. c.	18 26		I Sh. c.	15 04					III Sh. f.	19 15
	II Tr. f.	19 09		I Tr. f.	16 24	10	I Im.	0 22			
	II Sh. f.	20 55		I Sh. f.	17 13		III Em.	2 11	14	II Im.	3 59
2	I Tr. c.	1 14	6	III Tr. c.	9 47		III E. c.	3 08.8		II E. f.	7 54.1
	I Sh. c.	2 06		I Im.	11 22		I E. f.	3 20.0		I Tr. c.	10 44
	I Tr. f.	3 24		III Tr. f.	12 02		III E. f.	5 14.0		I Sh. c.	11 27
	I Sh. f.	4 16		III Sh. c.	13 12		II Im.	14 36		I Tr. f.	12 55
	III Im.	19 32		I E. f.	14 22.5		II E. f.	18 36.6		I Sh. f.	13 36
	III Em.	21 48		III Sh. f.	15 16		I Tr. c.	21 44			
	I Im.	22 22					I Sh. c.	22 29			
	III E. c.	23 10.1					I Tr. f.	23 54	15	I Im.	7 53
3	III E. f.	1 14.6	7	II Im.	1 11	11	I Sh. f.	0 39		I E. f.	10 46.1
	I E. f.	1 25.1		II E. f.	5 19.2		I Im.	18 52		II Tr. c.	22 15
	II Im.	11 48		I Tr. c.	8 44		I E. f.	21 48.7		II Sh. c.	23 39
	II E. f.	16 01.5		I Sh. c.	9 32				16	II Tr. f.	0 47
	I Tr. c.	19 44		I Tr. f.	10 54					II Sh. f.	2 09
	I Sh. c.	20 35		I Sh. f.	11 42	12	II Tr. c.	8 50		I Tr. c.	5 14
	I Tr. f.	21 54	8	I Im.	5 52		II Sh. c.	10 21		I Sh. c.	5 55
	I Sh. f.	22 44		I E. f.	8 51.2		II Tr. f.	11 22		I Tr. f.	7 25
4	I Im.	16 52		II Tr. c.	19 26		II Sh. f.	12 51		I Sh. f.	8 05
	I E. f.	19 53.8		II Sh. c.	21 02		I Tr. c.	16 14			
				II Tr. f.	21 58		I Sh. c.	16 58			
				II Sh. f.	23 32		I Tr. f.	18 25			
5	II Tr. c.	6 02	9	I Tr. c.	3 14	13	I Im.	13 23			
	II Sh. c.	7 44		I Sh. c.	4 01		III Tr. c.	14 10			

I	II	III	IV
Oct. 1, $x_1 = +1.7$; $y_1 = -0.3$	Oct. 3, $x_1 = +2.1$; $y_1 = -0.5$	Oct. 10, $x_1 = +1.1$; $y_1 = -0.7$	No eclipse
Oct. 15, $x_1 = +1.5$; $y_1 = -0.3$	Oct. 14, $x_1 = +1.9$; $y_1 = -0.4$	Oct. 10, $x_2 = +2.3$; $y_2 = -0.7$	
Eclipse commences ... E. c.	Transit commences ... Tr. c.		
Eclipse finishes ... E. f.	Transit finishes ... Tr. f.		
Occultation, immersion ... Im.	Shadow commences ... Sh. c.		
Occultation, emersion ... Em.	Shadow finishes ... Sh. f.		

619

Configurations at 17^h 30^m

PHASES OF THE ECLIPSES

 $\bigcirc f_*$ 

$c^* f^*$

No eclipse of this Satellite

SATELLITES OF JUPITER, 1935

DECEMBER

Jupiter being near the Sun the Phenomena of the Satellites
are not given from October 17 until December 17

Day		^h _m	Day		^h _m	Day		^h _m	Day		^h _m
18	I E. c.	1 46.2	22	I Sh. c.	11 58	26	I Sh. c.	0 54	29	II Sh. c.	15 03
	I Em.	4 20		I Tr. c.	12 23		I Tr. c.	1 23		I Sh. f.	16 01
	I Sh. c.	23 01		II Sh. c.	12 27		II Sh. c.	1 45		II Tr. c.	16 09
	II Sh. c.	23 08		II Tr. c.	13 18		II Tr. c.	2 42		I Tr. f.	16 34
	I Tr. c.	23 22		I Sh. f.	14 08		I Sh. f.	3 05		II Sh. f.	17 37
	II Tr. c.	23 52		I Tr. f.	14 33		I Tr. f.	3 34		II Tr. f.	18 45
				II Sh. f.	15 01		II Sh. f.	4 18			
				II Tr. f.	15 54		II Tr. f.	5 19			
							I E. c.	22 08.9			
19	I Sh. f.	1 11				27	I Em.	0 51	30	I E. c.	11 05.9
	I Tr. f.	1 33	23	I E. c.	9 11.8		I Sh. c.	19 23		I Em.	13 52
	II Sh. f.	1 42		I Em.	11 51		I Tr. c.	19 53			
	II Tr. f.	2 27					II E. c.	20 19.5	31	I Sh. c.	8 20
	I E. c.	20 14.8	24	I Sh. c.	6 26		I Sh. f.	21 33		I Tr. c.	8 53
	I Em.	22 50		II E. c.	7 02.9		I Tr. f.	22 04		II E. c.	9 36.1
20	I Sh. c.	17 29		I Sh. f.	8 36		III E. c.	22 52.6		I Sh. f.	10 30
	II E. c.	17 46.2		III Sh. c.	8 50		II Em.	23 54		I Tr. f.	11 04
	I Tr. c.	17 53		I Tr. f.	9 04					III Sh. c.	12 48
	III E. c.	18 54.4		II Em.	10 30	28	III Em.	3 18		II Em.	13 17
	I Sh. f.	19 39		III Tr. c.	10 37		I E. c.	16 37.4		III Sh. f.	15 02
	I Tr. f.	20 03		III Sh. f.	11 03		I Em.	19 22		III Tr. c.	15 02
	II Em.	21 07		III Tr. f.	12 59					III Tr. f.	17 25
	III Em.	22 51									
21	I E. c.	14 43.2	25	I E. c.	3 40.3	29	I Sh. c.	13 51	32	I E. c.	5 34.4
	I Em.	17 21		I Em.	6 21		I Tr. c.	14 23		I Em.	8 22
I			II			III			IV		
Dec. 18, $\alpha_1 = -1.2$; $\gamma_1 = -0.3$			Dec. 20, $\alpha_1 = -1.4$; $\gamma_1 = -0.5$			Dec. 20, $\alpha_1 = -1.5$; $\gamma_1 = -0.7$			No eclipse		

Eclipse commences ... E. c.
Eclipse finishes ... E. f.
Occultation, immersion ... Im.
Occultation, emersion ... Em.

Transit commences ... Tr. c.
Transit finishes ... Tr. f.
Shadow commences ... Sh. c.
Shadow finishes ... Sh. f.

SATELLITES OF JUPITER, 1935




621

DECEMBER

Configurations at 7^h 15^m

[illegible]

PHASES OF THE ECLIPSES

I		II	
III		IV	No eclipse of this Satellite

RINGS OF SATURN, 1935

ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION
AND APPEARANCE OF SATURN'S RINGS

Date	<i>a</i>	<i>b</i>	<i>U</i>	<i>B</i>	<i>P</i>	<i>U'</i>	<i>B'</i>	<i>P'</i>
Jan. 0	35° 92	+7° 56	201° 333	+12° 133	+6° 517	163° 296	+10° 359	+26° 814
4	35° 76	7° 41	201° 690	11° 959	6° 497	163° 413	10° 305	26° 832
8	35° 61	7° 27	202° 061	11° 777	6° 476	163° 530	10° 252	26° 849
12	35° 48	7° 13	202° 444	11° 590	6° 454	163° 647	10° 199	26° 867
16	35° 36	6° 99	202° 838	11° 397	6° 432	163° 764	10° 145	26° 885
20	35° 25	+6° 85	203° 242	+11° 200	+6° 408	163° 881	+10° 092	+26° 902
24	35° 15	6° 71	203° 654	10° 998	6° 384	163° 998	10° 039	26° 919
28	35° 07	6° 57	204° 073	10° 793	6° 358	164° 115	9° 985	26° 936
Feb. 1	35° 00	6° 43	204° 499	10° 584	6° 332	164° 231	9° 932	26° 953
5	34° 94	6° 29	204° 930	10° 372	6° 306	164° 348	9° 878	26° 970
9	34° 90	+6° 15	205° 365	+10° 159	+6° 280	164° 465	+ 9° 825	+26° 986
13	34° 87	6° 02	205° 802	9° 943	6° 252	164° 582	9° 771	27° 003
17	34° 85	5° 88	206° 241	9° 727	6° 224	164° 699	9° 717	27° 019
21	34° 85	5° 75	206° 681	9° 509	6° 196	164° 816	9° 663	27° 036
25	34° 86	5° 62	207° 121	9° 292	6° 168	164° 932	9° 609	27° 052
Mar. 1	34° 88	+5° 50	207° 559	+ 9° 076	+6° 140	165° 049	+ 9° 555	+27° 068
5	34° 92	5° 37	207° 994	8° 860	6° 112	165° 166	9° 501	27° 084
9	34° 97	5° 25	208° 426	8° 647	6° 083	165° 283	9° 447	27° 100
13	35° 03	5° 13	208° 853	8° 436	6° 054	165° 399	9° 393	27° 115
17	35° 10	5° 02	209° 275	8° 228	6° 026	165° 516	9° 339	27° 131
21	35° 19	+4° 91	209° 689	+ 8° 024	+5° 998	165° 633	+ 9° 285	+27° 146
25	35° 29	4° 80	210° 096	7° 823	5° 970	165° 749	9° 231	27° 162
29	35° 40	4° 70	210° 494	7° 628	5° 943	165° 866	9° 177	27° 177
Apr. 2	35° 53	4° 60	210° 882	7° 437	5° 916	165° 983	9° 123	27° 192
6	35° 67	4° 50	211° 259	7° 252	5° 889	166° 099	9° 068	27° 207
10	35° 82	+4° 41	211° 626	+ 7° 073	+5° 863	166° 216	+ 9° 014	+27° 222
14	35° 98	4° 32	211° 979	6° 901	5° 838	166° 333	8° 959	27° 236
18	36° 15	4° 24	212° 319	6° 737	5° 814	166° 449	8° 904	27° 251
22	36° 34	4° 17	212° 644	6° 581	5° 790	166° 566	8° 850	27° 265
26	36° 54	4° 10	212° 954	6° 432	5° 768	166° 683	8° 795	27° 280
30	36° 74	+4° 03	213° 248	+ 6° 292	+5° 747	166° 799	+ 8° 741	+27° 294
May 4	36° 95	3° 97	213° 525	6° 161	5° 727	166° 916	8° 686	27° 308
8	37° 17	3° 91	213° 784	6° 040	5° 708	167° 032	8° 632	27° 322
12	37° 40	3° 86	214° 024	5° 929	5° 690	167° 149	8° 577	27° 336
16	37° 64	3° 82	214° 245	5° 829	5° 674	167° 265	8° 522	27° 349
20	37° 89	+3° 79	214° 446	+ 5° 739	+5° 659	167° 382	+ 8° 467	+27° 363
24	38° 14	3° 76	214° 626	5° 661	5° 646	167° 499	8° 412	27° 376
28	38° 40	3° 74	214° 785	5° 594	5° 634	167° 615	8° 357	27° 390
June 1	38° 66	3° 73	214° 922	5° 539	5° 624	167° 732	8° 302	27° 403
5	38° 93	3° 73	215° 037	5° 496	5° 615	167° 848	8° 247	27° 416
9	39° 20	+3° 74	215° 129	+ 5° 465	+5° 609	167° 965	+ 8° 192	+27° 429
13	39° 47	3° 75	215° 197	5° 446	5° 604	168° 081	8° 137	27° 442
17	39° 74	3° 77	215° 242	5° 439	5° 601	168° 198	8° 081	27° 455
21	40° 01	3° 80	215° 264	5° 446	5° 599	168° 314	8° 026	27° 468
25	40° 28	3° 84	215° 262	5° 464	5° 600	168° 431	7° 971	27° 480
29	40° 54	+3° 89	215° 237	+ 5° 495	+5° 602	168° 547	+ 7° 916	+27° 493
July 3	40° 80	+3° 94	215° 188	+ 5° 537	+5° 606	168° 664	+ 7° 860	+27° 505

RINGS OF SATURN, 1935

623

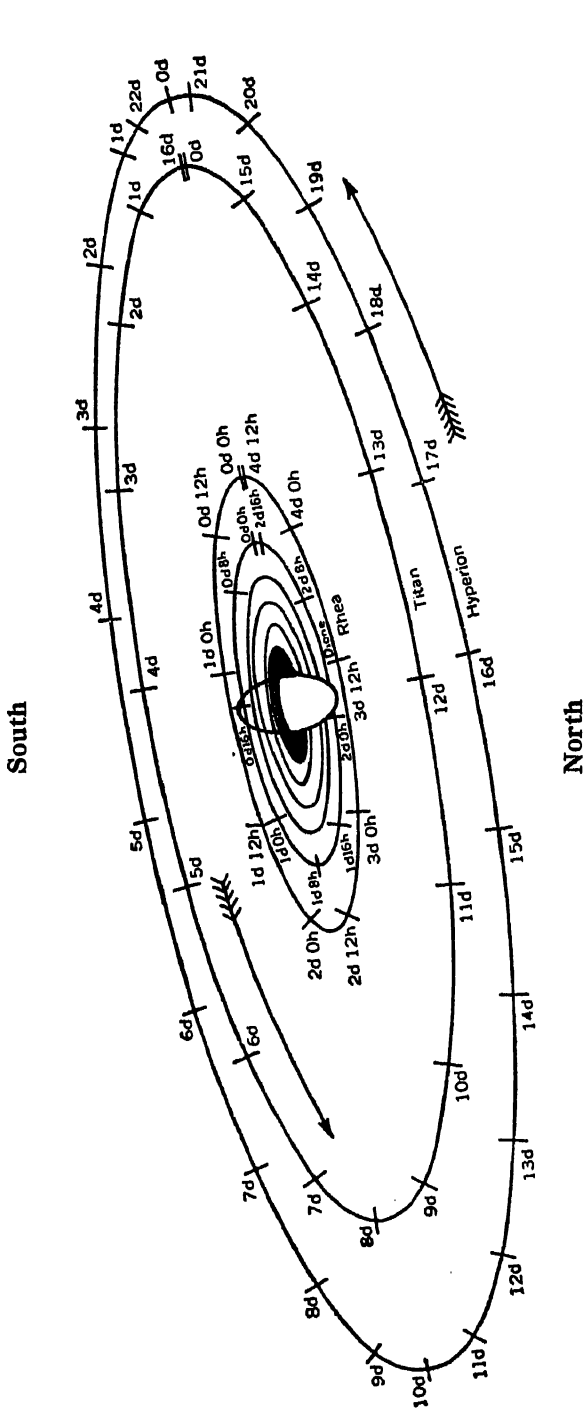
ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION AND APPEARANCE OF SATURN'S RINGS

Date	<i>a</i>	<i>b</i>	<i>U</i>	<i>B</i>	<i>P</i>	<i>U'</i>	<i>B'</i>	<i>P'</i>
July 3	40° 80	+3° 94	215° 188	+ 5° 537	+5° 606	168° 664	+ 7° 860	+27° 505
7	41° 05	4° 00	215° 117	5° 592	5° 611	168° 780	7° 805	27° 518
11	41° 29	4° 07	215° 023	5° 657	5° 619	168° 897	7° 749	27° 530
15	41° 52	4° 15	214° 908	5° 735	5° 628	169° 013	7° 694	27° 542
19	41° 74	4° 24	214° 771	5° 822	5° 638	169° 130	7° 638	27° 554
23	41° 96	+4° 33	214° 616	+ 5° 919	+5° 650	169° 246	+ 7° 582	+27° 565
27	42° 16	4° 43	214° 441	6° 026	5° 664	169° 363	7° 527	27° 576
31	42° 34	4° 53	214° 249	6° 140	5° 678	169° 479	7° 471	27° 588
Aug. 4	42° 50	4° 64	214° 040	6° 262	5° 694	169° 596	7° 415	27° 599
8	42° 64	4° 75	213° 817	6° 391	5° 711	169° 712	7° 360	27° 610
12	42° 76	+4° 86	213° 581	+ 6° 525	+5° 729	169° 829	+ 7° 304	+27° 621
16	42° 86	4° 97	213° 334	6° 664	5° 747	169° 945	7° 248	27° 632
20	42° 94	5° 09	213° 078	6° 806	5° 765	170° 062	7° 192	27° 643
24	42° 99	5° 20	212° 816	6° 951	5° 785	170° 178	7° 136	27° 653
28	43° 02	5° 31	212° 549	7° 096	5° 805	170° 295	7° 080	27° 664
Sept. 1	43° 03	+5° 42	212° 279	+ 7° 242	+5° 825	170° 411	+ 7° 024	+27° 674
5	43° 01	5° 53	212° 009	7° 386	5° 845	170° 528	6° 968	27° 684
9	42° 97	5° 63	211° 742	7° 528	5° 863	170° 644	6° 912	27° 695
13	42° 91	5° 72	211° 479	7° 666	5° 882	170° 761	6° 856	27° 705
17	42° 82	5° 81	211° 222	7° 799	5° 900	170° 877	6° 799	27° 715
21	42° 71	+5° 89	210° 974	+ 7° 926	+5° 918	170° 994	+ 6° 743	+27° 725
25	42° 58	5° 96	210° 737	8° 046	5° 935	171° 110	6° 687	27° 735
29	42° 43	6° 02	210° 513	8° 158	5° 951	171° 227	6° 631	27° 744
Oct. 3	42° 26	6° 07	210° 303	8° 262	5° 965	171° 343	6° 574	27° 754
7	42° 07	6° 11	210° 110	8° 356	5° 978	171° 459	6° 518	27° 763
11	41° 87	+6° 15	209° 936	+ 8° 440	+5° 990	171° 576	+ 6° 462	+27° 772
15	41° 66	6° 17	209° 781	8° 512	6° 000	171° 692	6° 405	27° 781
19	41° 43	6° 18	209° 648	8° 574	6° 010	171° 808	6° 349	27° 790
23	41° 19	6° 18	209° 536	8° 623	6° 017	171° 925	6° 292	27° 799
27	40° 94	6° 17	209° 447	8° 660	6° 023	172° 041	6° 235	27° 808
31	40° 68	+6° 14	209° 382	+ 8° 685	+6° 027	172° 158	+ 6° 179	+27° 816
Nov. 4	40° 42	6° 11	209° 341	8° 696	6° 030	172° 274	6° 122	27° 825
8	40° 15	6° 07	209° 325	8° 695	6° 030	172° 391	6° 065	27° 834
12	39° 88	6° 02	209° 333	8° 680	6° 030	172° 507	6° 008	27° 842
16	39° 61	5° 96	209° 367	8° 653	6° 027	172° 624	5° 952	27° 850
20	39° 34	+5° 89	209° 426	+ 8° 612	+6° 023	172° 740	+ 5° 895	+27° 858
24	39° 07	5° 81	209° 510	8° 559	6° 017	172° 857	5° 838	27° 866
28	38° 80	5° 73	209° 619	8° 493	6° 009	172° 973	5° 781	27° 873
Dec. 2	38° 53	5° 64	209° 752	8° 416	5° 999	173° 090	5° 724	27° 881
6	38° 27	5° 54	209° 908	8° 325	5° 989	173° 206	5° 667	27° 888
10	38° 02	+5° 44	210° 087	+ 8° 223	+5° 976	173° 323	+ 5° 610	+27° 896
14	37° 77	5° 33	210° 288	8° 111	5° 962	173° 439	5° 553	27° 903
18	37° 53	5° 22	210° 511	7° 987	5° 946	173° 556	5° 496	27° 910
22	37° 30	5° 10	210° 754	7° 853	5° 929	173° 672	5° 439	27° 917
26	37° 08	4° 98	211° 017	7° 709	5° 910	173° 789	5° 381	27° 924
30	36° 88	+4° 85	211° 299	+ 7° 555	+5° 890	173° 905	+ 5° 324	+27° 930
34	36° 68	+4° 72	211° 598	+ 7° 393	+5° 869	174° 022	+ 5° 267	+27° 937

RINGS OF SATURN, 1935

ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION
AND APPEARANCE OF SATURN'S RINGS

Date	RINGS					SATURN	
	Ω	i	N	J	ω	Stellar Mag.	Phase
Jan. 4	168.588	28.087	127.833	6.774	41.875	+1.0	+0.02
12	.588	.087	.834	.774	.874	1.1	.01
20	.588	.087	.835	.774	.873	1.1	.01
28	.589	.087	.836	.774	.873	1.1	.01
Feb. 5	.589	.087	.837	.774	.872	1.1	.00
13	168.589	28.087	127.838	6.774	41.871	+1.1	-0.00
21	.590	.087	.839	.773	.871	1.1	.00
Mar. 1	.590	.087	.840	.773	.870	1.1	.00
9	.590	.087	.840	.773	.869	1.1	.00
17	.590	.087	.841	.773	.869	1.1	.01
25	168.591	28.087	127.842	6.773	41.868	+1.2	-0.01
Apr. 2	.591	.087	.843	.773	.868	1.2	.01
10	.591	.087	.844	.773	.867	1.2	.02
18	.592	.087	.845	.773	.866	1.3	.02
26	.592	.087	.846	.773	.866	1.3	.03
May 4	168.592	28.087	127.847	6.773	41.865	+1.3	-0.04
12	.593	.087	.848	.772	.864	1.3	.04
20	.593	.087	.849	.772	.864	1.2	.04
28	.593	.087	.850	.772	.863	1.2	.05
June 5	.593	.087	.850	.772	.862	1.2	.05
13	168.594	28.087	127.851	6.772	41.862	+1.2	-0.05
21	.594	.087	.852	.772	.861	1.1	.04
29	.594	.087	.853	.772	.861	1.1	.04
July 7	.595	.087	.854	.772	.860	1.0	.03
15	.595	.087	.855	.772	.859	1.0	.03
23	168.595	28.087	127.856	6.772	41.859	+0.9	-0.02
31	.596	.087	.857	.772	.858	0.9	.02
Aug. 8	.596	.087	.858	.771	.857	0.8	.01
16	.596	.087	.859	.771	.857	0.8	.01
24	.597	.087	.860	.771	.856	0.7	.00
Sept. 1	168.597	28.087	127.860	6.771	41.855	+0.7	+0.00
9	.597	.087	.861	.771	.855	0.7	.00
17	.597	.087	.862	.771	.854	0.7	.00
25	.598	.087	.863	.771	.854	0.8	.01
Oct. 3	.598	.087	.864	.771	.853	0.8	.02
11	168.598	28.087	127.865	6.771	41.852	+0.8	+0.02
19	.599	.087	.866	.771	.852	0.9	.03
27	.599	.087	.867	.770	.851	0.9	.04
Nov. 4	.599	.087	.868	.770	.850	1.0	.04
12	.600	.087	.869	.770	.850	1.0	.04
20	168.600	28.087	127.870	6.770	41.849	+1.0	+0.04
28	.600	.087	.870	.770	.848	1.1	.04
Dec. 6	.601	.087	.871	.770	.848	1.1	.04
14	.601	.087	.872	.770	.847	1.1	.04
22	.601	.087	.873	.770	.847	1.2	.04
30	168.601	28.087	127.874	6.770	41.846	+1.2	+0.03
38	168.602	28.087	127.875	6.770	41.845	+1.2	+0.03



MEAN SYNODIC PERIODS	PERIODS	
	d	h
I	0	22.6
II	1	08.9
III	1	21.3
IV	2	17.7
V	4	12.5
VI	15	23.3
VII	21	07.6
VIII	79	22.1
IX	523	15.6

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN
AT DATE OF OPPOSITION, AUGUST 31, AS SEEN IN AN INVERTING
TELESCOPE

The orbits are elongated in the ratio of two to one in the
direction of their minor axes.

NAMES OF THE SATELLITES	
I	Mimas
II	Enceladus
III	Tethys
IV	Dione
V	Rhea
VI	Titan
VII	Hyperion
VIII	Iapetus
IX	Phoebe

SATELLITES OF SATURN, 1935

MIMAS

Greenwich Mean Time of Eastern Elongation

	d	h		d	h		d	h		d	h		d	h		d	h
May	20	21.5	June	27	14.2	Aug.	4	06.8	Sept.	10	23.4	Oct.	18	16.0	Nov.	25	08.9
	21	20.1		28	12.8		5	05.4		11	22.0		19	14.7		26	07.6
	22	18.7		29	11.4		6	04.1		12	20.6		20	13.3		27	06.2
	23	17.3		30	10.1		7	02.7		13	19.2		21	11.9		28	04.8
	24	15.9	July	1	08.7		8	01.3		14	17.9		22	10.5		29	03.4
	25	14.6		2	07.3		8	23.9		15	16.5		23	09.1		30	02.0
	26	13.2		3	05.9		9	22.5		16	15.1		24	07.8	Dec.	1	00.7
	27	11.8		4	04.5		10	21.1		17	13.7		25	06.4		1	23.3
	28	10.4		5	03.2		11	19.7		18	12.3		26	05.0		2	21.9
	29	09.1		6	01.8		12	18.3		19	10.9		27	03.6		3	20.5
	30	07.7		7	00.4		13	17.0		20	09.5		28	02.2		4	19.2
	31	06.3		7	23.0		14	15.6		21	08.2		29	00.8		5	17.8
June	1	04.9		8	21.6		15	14.2		22	06.8		29	23.5		6	16.4
	2	03.5		9	20.2		16	12.8		23	05.4		30	22.1		7	15.0
	3	02.2		10	18.8		17	11.4		24	04.0		31	20.7		8	13.7
	4	00.8		11	17.4		18	10.0		25	02.6	Nov.	1	19.3		9	12.3
	4	23.4		12	16.1		19	08.6		26	01.2		2	18.0		10	10.9
	5	22.0		13	14.7		20	07.2		26	23.8		3	16.6		11	09.5
	6	20.6		14	13.3		21	05.9		27	22.4		4	15.2		12	08.2
	7	19.2		15	11.9		22	04.5		28	21.0		5	13.8		13	06.8
	8	17.8		16	10.5		23	03.1		29	19.7		6	12.5		14	05.4
	9	16.4		17	09.1		24	01.7		30	18.3		7	11.1		15	04.0
	10	15.1		18	07.7		25	00.3	Oct.	1	16.9		8	09.7		16	02.6
	11	13.7		19	06.3		25	22.9		2	15.5		9	08.3		17	01.3
	12	12.3		20	05.0		26	21.5		3	14.2		10	07.0		17	23.9
	13	10.9		21	03.6		27	20.1		4	12.8		11	05.6		18	22.5
	14	09.6		22	02.2		28	18.7		5	11.4		12	04.2		19	21.1
	15	08.2		23	00.8		29	17.4		6	10.0		13	02.8		20	19.8
	16	06.8		23	23.4		30	16.0		7	08.6		14	01.4		21	18.4
	17	05.4		24	22.0		31	14.6		8	07.3		15	00.1		22	17.0
	18	04.0		25	20.6	Sept.	1	13.2		9	05.9		15	22.7		23	15.6
	19	02.7		26	19.2		2	11.9		10	04.5		16	21.3		24	14.3
	20	01.3		27	17.8		3	10.5		11	03.1		17	19.9		25	12.9
	20	23.9		28	16.5		4	09.1		12	01.7		18	18.6		26	11.5
	21	22.5		29	15.1		5	07.7		13	00.3		19	17.2		27	10.1
	22	21.1		30	13.7		6	06.3		13	22.9		20	15.8		28	08.8
	23	19.7		31	12.3		7	05.0		14	21.5		21	14.4		29	07.4
	24	18.3	Aug.	1	11.0		8	03.6		15	20.2		22	13.1		30	06.0
	25	16.9		2	09.6		9	02.2		16	18.8		23	11.7		31	04.6
	26	15.6		3	08.2		10	00.8		17	17.4		24	10.3		32	03.2

SATELLITES OF SATURN, 1935

627

ENCELADUS

Greenwich Mean Time of Eastern Elongation

May	d h	June	d h	Aug.	d h	Sept.	d h	Oct.	d h	Nov.	d h
21	00.1	28	08.9	5	17.5	13	02.1	21	10.7	28	19.6
22	09.0	29	17.8	7	02.4	14	10.9	22	19.6	30	04.5
23	17.9	July 1	02.7	8	11.3	15	19.8	24	04.5	Dec. 1	13.4
25	02.8	2	11.6	9	20.2	17	04.7	25	13.3	2	22.3
26	11.7	3	20.5	11	05.0	18	13.6	26	22.2	4	07.2
27	20.6	5	05.3	12	13.9	19	22.5	28	07.1	5	16.1
29	05.4	6	14.2	13	22.8	21	07.4	29	16.0	7	01.0
30	14.3	7	23.1	15	07.7	22	16.2	31	00.9	8	09.8
31	23.2	9	08.0	16	16.5	24	01.1	Nov. 1	09.8	9	18.7
June 2	08.1	10	16.8	18	01.4	25	10.0	2	18.7	11	03.6
3	17.0	12	01.7	19	10.3	26	18.9	4	03.6	12	12.5
5	01.9	13	10.6	20	19.2	28	03.7	5	12.4	13	21.4
6	10.8	14	19.5	22	04.0	29	12.6	6	21.3	15	06.3
7	19.7	16	04.3	23	12.9	30	21.5	8	06.2	16	15.2
9	04.6	17	13.2	24	21.8	Oct. 2	06.4	9	15.1	18	00.1
10	13.4	18	22.1	26	06.7	3	15.2	11	00.0	19	09.0
11	22.3	20	07.0	27	15.5	5	00.1	12	08.9	20	17.9
13	07.2	21	15.8	29	00.4	6	09.0	13	17.8	22	02.8
14	16.1	23	00.7	30	09.3	7	17.9	15	02.7	23	11.7
16	01.0	24	09.6	31	18.2	9	02.7	16	11.6	24	20.6
17	09.9	25	18.5	Sept. 2	03.0	10	11.6	17	20.5	26	05.5
18	18.7	27	03.4	3	11.9	11	20.5	19	05.4	27	14.4
20	03.6	28	12.2	4	20.8	13	05.4	20	14.3	28	23.3
21	12.5	29	21.1	6	05.7	14	14.3	21	23.1	30	08.2
22	21.4	31	06.0	7	14.5	15	23.2	23	08.0	31	17.1
24	06.3	Aug. 1	14.9	8	23.4	17	08.0	24	16.9		
25	15.2	2	23.8	10	08.3	18	16.9	26	01.8		
27	00.0	4	08.7	11	17.2	20	01.8	27	10.7		

TETHYS

Greenwich Mean Time of Eastern Elongation

May	d h	June	d h	Aug.	d h	Sept.	d h	Oct.	d h	Nov.	d h
21	20.4	28	14.5	5	08.5	12	02.3	19	20.2	26	14.5
23	17.7	30	11.9	7	05.8	13	23.6	21	17.6	28	11.8
25	15.0	July 2	09.2	9	03.1	15	20.9	23	14.9	30	09.1
27	12.3	4	06.5	11	00.4	17	18.2	25	12.2	Dec. 2	06.4
29	09.6	6	03.8	12	21.7	19	15.5	27	09.5	4	03.8
31	07.0	8	01.1	14	19.0	21	12.8	29	06.8	6	01.1
June 2	04.3	9	22.4	16	16.3	23	10.1	31	04.1	7	22.4
4	01.6	11	19.7	18	13.5	25	07.4	Nov. 2	01.4	9	19.7
5	22.9	13	17.0	20	10.8	27	04.7	3	22.7	11	17.1
7	20.2	15	14.3	22	08.1	29	02.0	5	20.0	13	14.4
9	17.5	17	11.5	24	05.4	30	23.3	7	17.3	15	11.7
11	14.8	19	08.8	26	02.7	Oct. 2	20.6	9	14.6	17	09.0
13	12.1	21	06.1	28	00.0	4	17.8	11	11.9	19	06.4
15	09.4	23	03.4	29	21.3	6	15.1	13	09.2	21	03.7
17	06.7	25	00.7	31	18.6	8	12.4	15	06.5	23	01.0
19	04.0	26	22.0	Sept. 2	15.8	10	09.7	17	03.9	24	22.3
21	01.3	28	19.3	4	13.1	12	07.0	19	01.2	26	19.6
22	22.6	30	16.6	6	10.4	14	04.3	20	22.5	28	17.0
24	19.9	Aug. 1	13.9	8	07.7	16	01.6	22	19.8	30	14.3
26	17.2	3	11.2	10	05.0	17	22.9	24	17.1	32	11.6

SATELLITES OF SATURN, 1935

DIONE

Greenwich Mean Time of Eastern Elongation

May ^d ^h 20 08.5 23 02.2 25 19.9 28 13.6 31 07.3	June ^d ^h 27 16.2 30 09.9 July 3 03.5 5 21.2 8 14.9	Aug. ^d ^h 4 23.5 7 17.1 10 10.8 13 04.5 15 22.1	Sept. ^d ^h 12 06.6 15 00.3 17 17.9 20 11.6 23 05.2	Oct. ^d ^h 20 14.0 23 07.6 26 01.3 28 19.0 31 12.7	Nov. ^d ^h 27 21.6 30 15.3 Dec. 3 09.0 6 02.7 8 20.5
June 3 01.0 5 18.7 8 12.4 11 06.1 13 23.8 16 17.4 19 11.1 22 04.8 24 22.5	11 08.6 14 02.3 16 19.9 19 13.6 22 07.2 25 00.9 27 18.5 30 12.2 Aug. 2 05.8	18 15.8 21 09.4 24 03.1 26 20.7 29 14.4 Sept. 1 08.0 4 01.7 6 19.3 9 13.0	25 22.9 28 16.6 Oct. 1 10.3 4 03.9 6 21.6 9 15.2 12 08.9 15 02.6 17 20.3	Nov. 3 06.4 6 00.1 8 17.7 11 11.4 14 05.1 16 22.8 19 16.5 22 10.2 25 03.9	11 14.2 14 07.9 17 01.6 19 19.3 22 13.0 25 06.8 28 00.5 30 18.2 33 11.9

RHEA

Greenwich Mean Time of Eastern Elongation

May ^d ^h 21 17.9 26 06.4 30 18.8	July ^d ^h 1 09.8 5 22.2 10 10.6	Aug. ^d ^h 11 01.1 15 13.4 20 01.8	Sept. ^d ^h 20 16.1 25 04.4 29 16.8	Oct. ^d ^h 31 07.4 Nov. 4 19.8 9 08.3	Dec. ^d ^h 10 23.5 15 12.0 20 00.5
June 4 07.3 8 19.7 13 08.1 17 20.6 22 09.0 26 21.4	14 23.0 19 11.3 23 23.7 28 12.1 Aug. 2 00.4 6 12.8	24 14.1 29 02.4 Sept. 2 14.8 7 03.1 11 15.4 16 03.7	Oct. 4 05.2 8 17.5 13 05.9 17 18.3 22 06.7 26 19.0	13 20.7 18 09.2 22 21.6 27 10.1 Dec. 1 22.5 6 11.0	24 13.0 29 01.5 33 14.0

TITAN

Greenwich Mean Time of Greatest Elongation

May ^d ^h 20 07.3 E	Aug. ^d ^h 7 23.9 E	Oct. ^d ^h 26 12.6 E	May ^d ^h 28 12.3 W	Aug. ^d ^h 16 04.1 W	Nov. ^d ^h 3 17.5
June 5 06.6 E	23 21.5 E	Nov. 11 11.2 E	June 13 11.3 W	Sept. 1 01.7 W	19 16.3
21 05.5 E	Sept. 8 19.0 E	27 10.2 E	29 10.0 W	16 23.3 W	Dec. 5 15.5
July 7 04.0 E	24 16.6 E	Dec. 13 09.7 E	July 15 08.3 W	Oct. 2 21.0 W	21 15.1
23 02.1 E	Oct. 10 14.4 E	29 09.5 E	31 06.3 W	18 19.1 W	

HYPERION

Greenwich Mean Time of Greatest Elongation

May ^d ^h 27 20.5 E	Aug. ^d ^h 21 06.3 E	Nov. ^d ^h 14 09.6 E	June ^d ^h 6 13.6 W	Aug. ^d ^h 30 23.1 W	Nov. ^d ^h 24 04.1
June 18 06.2 E	Sept. 11 13.1 E	Dec. 5 17.0 E	27 23.4 W	Sept. 21 05.9 W	Dec. 15 12.5
July 9 15.1 E	Oct. 2 19.7 E	27 00.7 E	July 19 08.1 W	Oct. 12 12.8 W	
30 23.1 E	24 02.5 E		Aug. 9 15.9 W	Nov. 2 20.2 W	

IAPETUS

Greenwich Mean Time of Conjunction and Greatest Elongation

May ^d ^h 28 03.4 E	June ^d ^h 17 11.6 I	July ^d ^h 8 05.6 W	July ^d ^h 27 11.7 S
Aug. 15 03.1 E	Sept. 4 00.2 I	Sept. 24 12.2 W	Oct. 13 19.0 S
Nov. 1 13.1 E	Nov. 21 16.9 I	Dec. 12 17.5 W	Dec. 32 12.1 S

SATELLITES OF SATURN, 1935

DIFFERENTIAL CO-ORDINATES OF PHOEBE

629

Date	$\alpha_P - \alpha_S$	$\delta_P - \delta_S$	Date	$\alpha_P - \alpha_S$	$\delta_P - \delta_S$	Date	$\alpha_P - \alpha_S$	$\delta_P - \delta_S$
Jan. 0	^m -1 ^s 25.2	['] -7 ["] 55	June 9	^m +0 ^s 33.4	['] + 6 ["] 03	Sept. 21	^m +2 ^s 12.1	['] +14 ["] 30
2	1 26.3	7 59	11	0 36.0	6 20	23	2 12.9	14 31
4	1 27.4	8 03	13	0 38.6	6 36	25	2 13.7	14 32
6	1 28.4	8 06	15	0 41.2	6 52	27	2 14.4	14 32
8	1 29.3	8 08	17	0 43.7	7 08	29	2 15.1	14 33
10	-1 30.1	-8 10	19	+0 46.3	+ 7 24	Oct. 1	+2 15.7	+14 33
12	1 30.8	8 12	21	0 48.8	7 40	3	2 16.2	14 32
14	1 31.5	8 13	23	0 51.3	7 55	5	2 16.7	14 32
16	1 32.0	8 14	25	0 53.8	8 10	7	2 17.2	14 31
18	1 32.4	8 14	27	0 56.3	8 25	9	2 17.6	14 30
20	-1 32.8	-8 14	29	+0 58.8	+ 8 40	11	+2 18.0	+14 28
22	-1 33.0	-8 14	July 1	1 01.2	8 55	13	2 18.3	14 27
...	...	...	3	1 03.6	9 09	15	2 18.5	14 25
Mar. 23	-1 03.0	-4 29	5	1 06.0	9 23	17	2 18.7	14 23
25	1 01.0	4 16	7	1 08.4	9 37	19	2 18.9	14 20
27	-0 59.0	-4 02	9	+1 10.8	+ 9 51	21	+2 19.0	+14 17
29	0 56.9	3 48	11	1 13.1	10 04	23	2 19.0	14 14
31	0 54.8	3 34	13	1 15.4	10 17	25	2 19.0	14 11
Apr. 2	0 52.6	3 20	15	1 17.6	10 30	27	2 18.9	14 08
4	0 50.4	3 05	17	1 19.9	10 43	29	2 18.8	14 04
6	-0 48.2	-2 50	19	+1 22.1	+10 55	31	+2 18.7	+14 01
8	0 45.9	2 35	21	1 24.3	11 07	Nov. 2	2 18.5	13 57
10	0 43.6	2 20	23	1 26.4	11 18	4	2 18.2	13 52
12	0 41.3	2 05	25	1 28.5	11 30	6	2 17.9	13 47
14	0 38.9	1 49	27	1 30.6	11 41	8	2 17.5	13 43
16	-0 36.5	-1 33	29	+1 32.6	+11 51	10	+2 17.1	+13 38
18	0 34.1	1 17	31	1 34.6	12 02	12	2 16.6	13 32
20	0 31.7	1 01	Aug. 2	1 36.6	12 12	14	2 16.1	13 27
22	0 29.2	0 44	4	1 38.5	12 21	16	2 15.6	13 21
24	0 26.7	0 28	6	1 40.4	12 31	18	2 14.9	13 15
26	-0 24.2	-0 11	8	+1 42.3	+12 40	20	+2 14.2	+13 09
28	0 21.7	+0 05	10	1 44.1	12 48	22	2 13.5	13 03
30	0 19.1	0 22	12	1 45.9	12 57	24	2 12.8	12 56
May 2	0 16.6	0 39	14	1 47.6	13 05	26	2 11.9	12 49
4	0 14.0	0 56	16	1 49.3	13 12	28	2 11.0	12 42
6	-0 11.4	+1 13	18	+1 51.0	+13 19	30	+2 10.1	+12 35
8	0 08.8	1 30	20	1 52.6	13 26	Dec. 2	2 09.1	12 27
10	0 06.2	1 48	22	1 54.2	13 33	4	2 08.1	12 20
12	0 03.6	2 05	24	1 55.7	13 39	6	2 07.0	12 12
14	-0 00.9	2 22	26	1 57.2	13 45	8	2 05.9	12 03
16	+0 01.7	+2 39	28	+1 58.6	+13 50	10	+2 04.8	+11 55
18	0 04.3	2 57	30	2 00.0	13 55	12	2 03.5	11 46
20	0 07.0	3 14	Sept. 1	2 01.3	14 00	14	2 02.3	11 37
22	0 09.6	3 31	3	2 02.6	14 05	16	2 00.9	11 28
24	0 12.3	3 48	5	2 03.9	14 09	18	1 59.6	11 18
26	+0 14.9	+4 05	7	+2 05.1	+14 13	20	+1 58.2	+11 09
28	0 17.6	4 22	9	2 06.2	14 16	22	1 56.7	10 59
30	0 20.2	4 39	11	2 07.3	14 19	24	1 55.2	10 49
June 1	0 22.9	4 56	13	2 08.4	14 22	26	1 53.6	10 38
3	0 25.5	5 13	15	2 09.4	14 24	28	1 52.0	10 28
5	+0 28.1	+5 30	17	+2 10.4	+14 26	30	+1 50.4	+10 17
7	+0 30.8	+5 47	19	+2 11.3	+14 28	32	+1 48.7	+10 05

DIFFERENTIAL CO-ORDINATES OF HYPERION

Date	$\alpha_H - \alpha_S$	$\delta_H - \delta_S$	Date	$\alpha_H - \alpha_S$	$\delta_H - \delta_S$	Date	$\alpha_H - \alpha_S$	$\delta_H - \delta_S$
May 20	- 7.9	+32.7	Aug. 4	+ 2.1	-28.7	Oct. 19	+ 1.8	+34.2
22	- 0.8	+25.7	6	- 7.4	-12.9	21	+ 9.5	+14.2
24	+ 6.5	+11.1	8	-14.3	+ 9.1	23	+14.0	-10.2
26	+11.9	- 6.1	10	-16.4	+27.1	25	+13.2	-31.7
28	+13.3	-21.6	12	-13.7	+38.1	27	+ 7.2	-38.8
June 30	+ 9.5	-27.5	14	- 7.2	+39.1	29	- 2.0	-30.2
1	+ 1.6	-22.5	16	+ 1.2	+29.1	31	-10.4	- 9.2
3	- 7.1	- 8.1	18	+ 9.2	+11.1	Nov. 2	-15.1	+16.1
5	-13.1	+10.1	20	+14.3	-10.1	4	-15.0	+35.9
7	-14.9	+25.7	22	+14.2	-28.7	6	-10.7	+44.2
9	-12.3	+32.1	24	+ 8.2	-35.9	8	- 3.5	+42.1
11	- 6.4	+31.1	26	- 1.3	-26.9	10	+ 4.5	+28.2
13	+ 1.3	+21.1	28	-10.4	- 7.1	12	+11.1	+ 6.2
15	+ 8.6	+ 6.1	30	-15.7	+16.1	14	+13.9	-18.1
17	+13.3	-11.1	Sept. 1	-16.1	+34.8	16	+11.3	-34.2
19	+13.2	-25.3	3	-11.8	+42.2	18	+ 4.0	-36.1
21	+ 7.7	-28.9	5	- 4.4	+40.1	20	- 5.0	-22.2
23	- 1.2	-19.9	7	+ 4.3	+26.1	22	-12.1	0.2
25	- 9.6	- 2.1	9	+11.6	+ 5.1	24	-15.0	+22.1
27	-14.7	+16.1	11	+15.0	-18.1	26	-13.4	+37.5
July 29	-15.1	+29.5	13	+12.7	-34.2	28	- 8.2	+42.6
1	-11.2	+34.4	15	+ 5.0	-36.1	30	- 0.8	+36.1
3	- 4.3	+30.1	17	- 4.9	-23.1	Dec. 2	+ 6.8	+19.2
5	+ 3.8	+18.1	19	-12.8	0.2	4	+12.1	- 3.1
7	+10.8	+ 1.1	21	-16.3	+23.1	6	+13.1	-24.1
9	+14.3	-17.1	23	-14.9	+39.6	8	+ 8.9	-34.4
11	+12.4	-28.0	25	- 9.3	+45.6	10	+ 0.8	-30.1
13	+ 5.2	-28.1	27	- 1.2	+39.1	12	- 7.5	-14.2
15	- 4.2	-16.1	29	+ 7.1	+22.1	14	-13.1	+ 8.1
17	-12.1	+ 3.1	Oct. 1	+13.2	- 2.1	16	-14.4	+27.1
19	-15.8	+21.1	3	+14.6	-25.1	18	-11.7	+37.1
21	-14.8	+33.1	5	+10.2	-38.1	20	- 5.7	+38.1
23	- 9.6	+36.1	7	+ 1.4	-34.1	22	+ 1.7	+28.1
25	- 1.8	+30.1	9	- 8.0	-16.1	24	+ 8.5	+10.1
27	+ 6.5	+15.1	11	-14.4	+ 8.1	26	+12.5	-11.1
Aug. 29	+12.8	- 5.1	13	-16.0	+30.1	28	+11.8	-27.4
31	+14.8	-23.9	15	-13.0	+43.1	30	+ 6.2	-31.8
2	+10.7	-32.4	17	- 6.4	+45.1	32	- 2.0	-23.1
4	+ 2.1	-28.4	19	+ 1.8	+34.1			

SATELLITES OF SATURN, 1935

DIFFERENTIAL CO-ORDINATES OF IAPETUS

631

Date	$\alpha_1 - \alpha_8$	$\delta_1 - \delta_8$	Date	$\alpha_1 - \alpha_8$	$\delta_1 - \delta_8$	Date	$\alpha_1 - \alpha_8$	$\delta_1 - \delta_8$
May 20	+25.8	+13.9	Aug. 4	+21.9	+1.1	Oct. 19	+15.4	-3.7
22	28.9	22.8	6	26.6	11.9	21	20.5	+4.7
24	31.2	30.7	8	30.6	20.9	23	25.1	11.6
26	32.7	37.7	10	33.7	28.8	25	29.0	17.6
28	33.4	44.6	12	35.9	36.8	27	32.0	23.5
June 30	+33.2	+50.5	14	+37.1	+43.6	29	+34.1	+28.4
1	32.2	55.3	16	37.3	49.4	31	35.3	32.3
3	30.4	58.2	18	36.5	53.2	Nov. 2	35.6	35.2
5	27.8	60.0	20	34.8	55.0	4	34.9	37.1
7	24.6	60.1	22	32.2	55.0	6	33.3	38.1
9	+20.7	+59.3	24	+28.7	+55.2	8	+31.0	+39.1
11	16.3	56.4	26	24.5	53.3	10	27.8	38.1
13	11.4	52.5	28	19.7	50.3	12	24.0	37.2
15	6.2	47.6	30	14.3	46.4	14	19.6	35.3
17	+0.9	41.8	Sept. 1	8.6	40.7	16	14.8	32.4
19	-4.5	+33.8	3	+2.7	+33.7	18	+9.7	+28.4
21	9.8	25.9	5	-3.3	26.8	20	+4.4	24.5
23	14.9	16.9	7	9.2	18.8	22	-1.0	19.5
25	19.8	+7.9	9	14.9	10.8	24	6.3	14.6
27	24.2	-3.10	11	20.2	+2.8	26	11.5	8.6
29	-28.1	-13.9	13	-25.0	-6.8	28	-16.3	+2.6
July 1	31.3	22.9	15	29.2	14.7	30	20.7	-4.6
3	33.8	31.8	17	32.7	21.6	Dec. 2	24.6	10.6
5	35.5	39.7	19	35.4	27.6	4	27.9	16.5
7	36.4	46.6	21	37.3	33.5	6	30.6	21.5
9	-36.4	-52.4	23	-38.2	-38.3	8	-32.5	-26.4
11	35.5	56.3	25	38.2	41.2	10	33.7	30.4
13	33.7	59.2	27	37.2	43.2	12	34.1	34.3
15	31.0	61.0	29	35.3	45.0	14	33.7	37.2
17	27.5	61.2	Oct. 1	32.5	45.1	16	32.5	39.2
19	-23.2	-59.3	3	-28.8	-44.2	18	-30.5	-41.1
21	18.3	56.5	5	24.4	42.4	20	27.8	42.1
23	12.9	51.6	7	19.5	38.4	22	24.4	41.2
25	7.1	45.8	9	14.0	33.5	24	20.4	39.2
27	-1.0	37.9	11	8.2	28.6	26	16.0	37.3
29	+5.1	-28.9	13	-2.2	-22.6	28	-11.2	-34.4
31	11.0	19.10	15	+3.9	16.6	30	6.2	30.5
Aug. 2	16.6	-9.10	17	9.8	10.6	32	-1.0	-25.5
4	+21.9	+1.10	19	+15.4	-3.7			

Date	MIMAS		ENCELADUS		TETHYS		DIONE	
	$P-P_0$	$\frac{a(\Delta)}{\Delta}$	$P-P_0$	$\frac{a(\Delta)}{\Delta}$	$P-P_0$	$\frac{a(\Delta)}{\Delta}$	$P-P_0$	$\frac{a(\Delta)}{\Delta}$
May 16	+1.0	25.7	-0.3	32.9	-1.3	40.7	-0.4	52.2
21	0.9	25.9	0.3	33.2	1.3	41.1	0.4	52.6
26	0.8	26.1	0.4	33.5	1.4	41.4	0.4	53.0
31	0.6	26.3	0.4	33.7	1.4	41.8	0.4	53.5
June 5	0.5	26.5	0.4	34.0	1.4	42.1	0.4	54.0
10	+0.4	26.8	-0.4	34.3	-1.4	42.5	-0.4	54.4
15	0.3	27.0	0.4	34.6	1.4	42.9	0.4	54.9
20	+0.1	27.2	0.4	34.9	1.4	43.2	0.4	55.4
25	0.0	27.4	0.4	35.2	1.4	43.6	0.4	55.8
30	-0.1	27.7	0.4	35.5	1.4	44.0	0.4	56.3
July 5	-0.2	27.9	-0.4	35.8	-1.4	44.3	-0.4	56.7
10	0.4	28.1	0.4	36.0	1.4	44.6	0.4	57.2
15	0.5	28.3	0.4	36.3	1.4	45.0	0.4	57.6
20	0.6	28.5	0.3	36.6	1.4	45.3	0.4	57.9
25	0.7	28.7	0.3	36.8	1.4	45.5	0.4	58.3
30	-0.8	28.8	-0.3	37.0	-1.4	45.8	-0.3	58.6
Aug. 4	1.0	29.0	0.3	37.2	1.4	46.0	0.3	58.9
9	1.1	29.1	0.2	37.3	1.4	46.2	0.3	59.1
14	1.2	29.2	0.2	37.4	1.3	46.3	0.3	59.3
19	1.2	29.3	0.2	37.5	1.3	46.4	0.2	59.5
24	-1.3	29.3	-0.2	37.6	-1.3	46.5	-0.2	59.6
29	1.3	29.3	0.2	37.6	1.2	46.6	0.2	59.6
Sept. 3	1.4	29.3	0.2	37.6	1.2	46.6	0.2	59.6
8	1.4	29.3	0.1	37.6	1.2	46.5	0.2	59.6
13	1.5	29.2	0.1	37.5	1.2	46.4	0.2	59.5
18	-1.6	29.2	-0.1	37.4	-1.2	46.3	-0.1	59.3
23	1.6	29.0	-0.1	37.3	1.2	46.2	0.1	59.1
28	1.6	29.0	0.0	37.1	1.2	46.0	0.1	58.9
Oct. 3	1.6	28.8	0.0	37.0	1.1	45.7	-0.1	58.6
8	1.6	28.6	0.0	36.8	1.1	45.5	0.0	58.3
13	-1.6	28.5	0.0	36.5	-1.1	45.2	0.0	57.9
18	1.6	28.3	0.0	36.3	1.1	44.9	0.0	57.5
23	1.6	28.1	0.0	36.0	1.1	44.6	0.0	57.1
28	1.6	27.9	0.0	35.7	1.1	44.2	0.0	56.7
Nov. 2	1.5	27.6	0.0	35.5	1.1	43.9	0.0	56.2
7	-1.5	27.4	0.0	35.2	-1.1	43.5	0.0	55.7
12	1.4	27.2	0.0	34.9	1.1	43.2	0.0	55.3
17	1.3	26.9	0.0	34.6	1.1	42.8	0.0	54.8
22	1.2	26.7	0.0	34.3	1.1	42.4	0.0	54.3
27	1.2	26.5	0.0	34.0	1.1	42.1	0.0	53.9
Dec. 2	-1.1	26.3	0.0	33.7	-1.1	41.7	0.0	53.4
7	1.0	26.0	0.0	33.4	1.1	41.4	0.0	53.0
12	0.8	25.8	0.0	33.1	1.1	41.0	-0.1	52.5
17	0.7	25.6	0.0	32.9	1.1	40.7	0.1	52.1
22	0.6	25.4	-0.1	32.6	1.1	40.4	0.1	51.7
27	-0.5	25.2	-0.1	32.4	-1.1	40.1	-0.1	51.3
32	-0.4	25.1	-0.1	32.2	-1.2	39.8	-0.1	51.0

Time from Eastern Elongation	MIMAS		Time from Eastern Elongation	ENCELADUS		TETHYS		Time from Eastern Elongation	DIONE	
	p^1	F		p^1	F	p^1	F		p^1	F
^h 0.0	96.0	1.000	^d ^h 0 00	96.0	1.000	96.0	1.000	^d ^h 0 00	96.0	1.000
0.5	96.9	0.990	0 01	97.4	0.982	97.0	0.991	0 02	97.4	0.982
1.0	97.8	0.962	0 02	98.9	0.929	98.0	0.962	0 04	98.9	0.929
1.5	98.7	0.915	0 03	100.6	0.843	99.1	0.916	0 06	100.7	0.842
2.0	99.8	0.851	0 04	102.8	0.727	100.4	0.852	0 08	102.9	0.726
2.5	101.1	0.771	0 05	106.0	0.586	101.9	0.773	0 10	106.2	0.586
3.0	102.7	0.677	0 06	111.5	0.427	103.7	0.680	0 12	111.7	0.427
3.5	104.9	0.570	0 07	123.8	0.261	106.2	0.574	0 14	124.2	0.261
4.0	108.2	0.454	0 08	167.3	0.132	109.9	0.459	0 16	168.3	0.133
4.5	113.9	0.331	0 09	236.1	0.192	116.3	0.338	0 18	236.2	0.196
5.0	126.3	0.209	0 10	256.5	0.354	129.6	0.219	0 20	256.4	0.356
5.5	164.2	0.115	0 11	264.0	0.518	165.8	0.130	0 22	263.9	0.520
6.0	227.9	0.143	0 12	267.9	0.667	223.2	0.154	1 00	267.9	0.670
6.5	251.8	0.255	0 13	270.5	0.795	248.4	0.259	1 02	270.4	0.797
7.0	260.7	0.378	0 14	272.4	0.895	258.4	0.380	1 04	272.4	0.896
7.5	265.2	0.499	0 15	274.0	0.963	263.5	0.499	1 06	274.0	0.964
8.0	268.0	0.612	0 16	275.4	0.996	266.7	0.612	1 08	275.4	0.997
8.5	269.9	0.715	0 17	276.8	0.994	269.0	0.713	1 10	276.8	0.994
9.0	271.4	0.804	0 18	278.2	0.957	270.7	0.802	1 12	278.3	0.955
9.5	272.6	0.878	0 19	279.8	0.885	272.1	0.876	1 14	279.9	0.883
10.0	273.7	0.936	0 20	281.8	0.782	273.3	0.934	1 16	281.9	0.779
10.5	274.6	0.976	0 21	284.4	0.651	274.4	0.974	1 18	284.6	0.647
11.0	275.5	0.997	0 22	288.6	0.499	275.4	0.996	1 20	288.9	0.495
11.5	276.3	0.999	0 23	296.8	0.334	276.3	0.999	1 22	297.4	0.330
12.0	277.2	0.982	1 00	320.5	0.177	277.3	0.983	2 00	322.2	0.174
12.5	278.1	0.946	1 01	33.2	0.140	278.4	0.948	2 02	35.1	0.145
13.0	279.1	0.893	1 02	70.4	0.280	279.5	0.896	2 04	70.7	0.286
13.5	280.3	0.823	1 03	81.3	0.446	281.0	0.827	2 06	81.4	0.452
14.0	281.7	0.737	1 04	86.4	0.603	282.4	0.742	2 08	86.4	0.609
14.5	283.5	0.638	1 05	89.4	0.742	284.5	0.644	2 10	89.5	0.746
15.0	286.0	0.527	1 06	91.6	0.854	287.3	0.535	2 12	91.6	0.858
15.5	290.0	0.407	1 07	93.3	0.937	291.7	0.417	2 14	93.3	0.939
16.0	297.4	0.284	1 08	94.8	0.986	299.7	0.296	2 16	94.8	0.987
16.5	315.6	0.166	1 09	96.2	1.000	318.1	0.182	2 18	96.2	1.000
17.0	11.4	0.107	1 10	97.6	0.978	7.3	0.123	2 20	97.6	0.976
17.5	60.4	0.182	1 11			55.1	0.186			
18.0	76.1	0.302	1 12			72.8	0.301			
18.5	82.7	0.425	1 13			80.5	0.422			
19.0	86.4	0.544	1 14			84.8	0.539			
19.5	88.8	0.653	1 15			87.6	0.648			
20.0	90.5	0.750	1 16			89.6	0.746			
20.5	91.9	0.834	1 17			91.2	0.830			
21.0	93.0	0.902	1 18			92.5	0.898			
21.5	94.0	0.953	1 19			93.7	0.950			
22.0	94.9	0.985	1 20			94.7	0.984			
22.5	95.8	1.000	1 21			95.7	0.999			
23.0	96.6	0.994	1 22			96.7	0.995			

Position angle of satellite $p = p^1 + (P - P_0)$

Apparent distance of satellite $s = F \frac{\alpha(\Delta)}{\Delta}$

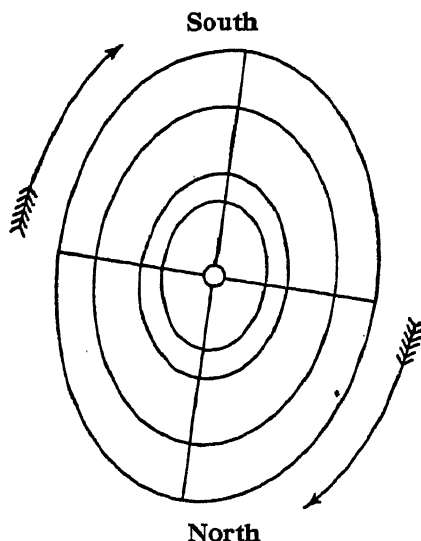
Date	RHEA		TITAN		HYPERION		IAPETUS	
	$P-P_0$	$\frac{a(\Delta)}{\Delta}$	$P-P_0$	$\frac{a(\Delta)}{\Delta}$	$P-P_0$	$\frac{a(\Delta)}{\Delta}$	$P-P_0$	$\frac{a(\Delta)}{\Delta}$
May 16	-0.5	72.9	-0.7	169	-0.3	205	0.0	492
21	0.5	73.5	0.7	170	0.3	206	-0.1	496
26	0.5	74.1	0.7	172	0.3	208	0.1	500
31	0.5	74.7	0.7	173	0.4	210	0.2	505
June 5	0.5	75.4	0.7	175	0.4	212	0.2	509
10	-0.5	76.0	-0.8	176	-0.4	214	-0.2	514
15	0.6	76.7	0.8	178	0.4	215	0.3	518
20	0.6	77.3	0.8	179	0.4	217	0.3	522
25	0.6	78.0	0.8	181	0.4	219	0.3	527
30	0.6	78.6	0.8	182	0.4	221	0.3	531
July 5	-0.6	79.2	-0.8	184	-0.4	223	-0.2	535
10	0.5	79.8	0.7	185	0.4	224	0.2	539
15	0.5	80.4	0.7	186	0.4	226	0.2	543
20	0.5	80.9	0.7	188	0.3	227	0.1	547
25	0.5	81.4	0.7	189	0.3	229	-0.1	550
30	-0.5	81.9	-0.7	190	-0.3	230	0.0	553
Aug. 4	0.5	82.3	0.7	191	0.3	231	0.0	556
9	0.4	82.6	0.7	191	0.3	232	+0.1	558
14	0.4	82.9	0.6	192	0.3	233	0.2	560
19	0.4	83.1	0.6	193	0.2	233	0.3	561
24	-0.4	83.2	-0.6	193	-0.2	234	+0.4	562
29	0.3	83.3	0.6	193	0.2	234	0.4	563
Sept. 3	0.3	83.3	0.5	193	0.2	234	0.5	563
8	0.3	83.2	0.5	193	0.1	234	0.6	562
13	0.3	83.1	0.5	193	0.1	233	0.7	561
18	-0.2	82.9	-0.5	192	-0.1	233	+0.8	560
23	0.2	82.6	0.4	191	0.1	232	0.9	558
Oct. 28	0.2	82.2	0.4	191	-0.1	231	0.9	556
3	0.2	81.8	0.4	190	0.0	230	1.0	553
8	0.2	81.4	0.4	189	0.0	229	1.1	550
13	-0.2	80.9	-0.4	187	0.0	227	+1.1	546
18	0.1	80.3	0.4	186	0.0	226	1.2	543
23	0.1	79.7	0.4	185	0.0	224	1.2	539
28	0.1	79.1	0.3	183	0.0	222	1.2	535
Nov. 2	0.1	78.5	0.3	182	0.0	221	1.2	530
7	-0.1	77.8	-0.3	180	0.0	219	+1.2	526
12	0.1	77.2	0.3	179	0.0	217	1.2	522
17	0.1	76.5	0.3	177	0.0	215	1.2	517
22	0.1	75.9	0.3	175	0.0	213	1.2	513
27	0.1	75.2	0.4	174	0.0	211	1.2	508
Dec. 2	-0.2	74.6	-0.4	173	0.0	209	+1.1	504
7	0.2	74.0	0.4	171	0.0	208	1.1	500
12	0.2	73.4	0.4	170	0.0	206	1.0	496
17	0.2	72.8	0.4	169	-0.1	204	0.9	492
22	0.2	72.2	0.4	167	0.1	203	0.9	488
27	-0.2	71.7	-0.5	166	-0.1	201	+0.8	484
32	-0.3	71.2	-0.5	165	-0.1	200	+0.7	481

Time from Eastern Elonga- tion	RHEA		Time from Eastern Elonga- tion	TITAN		HYPERION		Time from Eastern Elonga- tion	IAPETUS	
	p^1	F		p^1	F	p^1	F		p^1	F
d h			d h					d		
0 00	96.0	1.000	0 00	96.0	1.018	96.0	0.947	0	85.0	0.987
0 03	97.2	0.985	0 10	97.2	1.008	97.1	0.930	2	84.5	0.979
0 06	98.5	0.941	0 20	98.4	0.974	98.2	0.896	4	84.0	0.945
0 09	99.9	0.869	1 06	99.7	0.916	99.4	0.847	6	83.4	0.888
0 12	101.7	0.772	1 16	101.2	0.836	100.8	0.781	8	82.8	0.808
0 15	104.1	0.652	2 02	103.1	0.735	102.4	0.702	10	81.9	0.709
0 18	107.7	0.514	2 12	105.7	0.618	104.6	0.609	12	80.8	0.592
0 21	114.0	0.365	2 22	109.6	0.488	107.6	0.506	14	79.1	0.462
1 00	129.5	0.215	3 08	116.6	0.349	112.2	0.395	16	75.9	0.321
1 03	183.1	0.121	3 18	132.7	0.213	120.6	0.280	18	67.5	0.176
1 06	240.6	0.205	4 04	181.2	0.129	139.8	0.174	20	9.7	0.054
1 09	257.3	0.354	4 14	235.7	0.196	188.3	0.122	22	286.0	0.149
1 12	264.0	0.504	5 00	254.3	0.329	234.1	0.183	24	275.1	0.295
1 15	267.7	0.643	5 10	262.0	0.468	251.7	0.290	26	271.4	0.437
1 18	270.1	0.764	5 20	266.2	0.600	259.6	0.405	28	269.5	0.570
1 21	271.9	0.863	6 06	268.9	0.717	264.0	0.517	30	268.3	0.690
2 00	273.4	0.937	6 16	270.9	0.816	266.8	0.623	32	267.5	0.795
2 03	274.7	0.983	7 02	272.5	0.895	268.9	0.719	34	266.8	0.881
2 06	275.9	1.000	7 12	273.9	0.949	270.5	0.804	36	266.2	0.947
2 09	277.1	0.987	7 22	275.2	0.977	271.8	0.877	38	265.7	0.990
2 12	278.4	0.945	8 08	276.4	0.979	272.9	0.938	40	265.2	1.010
2 15	279.8	0.875	8 18	277.7	0.953	273.9	0.986	42	264.8	1.006
2 18	281.6	0.779	9 04	279.0	0.899	274.8	1.019	44	264.3	0.978
2 21	283.9	0.661	9 14	280.6	0.821	275.7	1.040	46	263.8	0.925
3 00	287.4	0.524	10 00	282.6	0.719	276.6	1.046	48	263.2	0.849
3 03	293.4	0.376	10 10	285.4	0.597	277.4	1.039	50	262.4	0.752
3 06	307.7	0.225	10 20	289.6	0.460	278.3	1.019	52	261.4	0.636
3 09	357.4	0.123	11 06	297.8	0.314	279.2	0.987	54	259.9	0.503
3 12	58.5	0.196	11 16	319.6	0.177	280.2	0.943	56	257.3	0.358
3 15	76.6	0.343	12 02	23.9	0.130	281.3	0.888	58	250.8	0.205
3 18	83.7	0.494	12 12	65.7	0.239	282.6	0.822	60	211.1	0.063
3 21	87.5	0.634	12 22	78.6	0.385	284.1	0.748	62	107.0	0.134
4 00	90.0	0.756	13 08	84.4	0.528	285.9	0.665	64	94.7	0.288
4 03	91.8	0.857	13 18	87.8	0.660	288.3	0.575	66	91.0	0.438
4 06	93.3	0.933	14 04	90.1	0.775	291.7	0.480	68	89.1	0.576
4 09	94.6	0.981	14 14	91.8	0.870	296.7	0.381	70	87.9	0.699
4 12	95.8	1.000	15 00	93.3	0.943	305.3	0.284	72	87.1	0.803
4 15	97.0	0.989	15 10	94.5	0.992	322.2	0.195	74	86.4	0.886
			15 20	95.7	1.016	357.4	0.143	76	85.8	0.945
			16 06	96.8	1.013	39.5	0.168	78	85.3	0.979
			16 16			62.4	0.247	80	84.8	0.987
			17 02			73.3	0.342	82	84.3	0.970
			17 12			79.4	0.440			
			17 22			83.4	0.536			
			18 08			86.1	0.626			
			18 18			88.2	0.708			
			19 04			89.8	0.780			
			19 14			91.3	0.841			
			20 00			92.5	0.890			
			20 10			93.6	0.925			
			20 20			94.7	0.945			
			21 06			95.7	0.949			
			21 16			96.8	0.936			

Position angle of satellite $p = p^1 + (P - P_0)$ Apparent distance of satellite $s = F \frac{a(\Delta)}{\Delta}$

SATELLITES OF URANUS, 1935

APPARENT ORBITS OF THE SATELLITES OF URANUS AT DATE OF
OPPOSITION, OCTOBER 27, AS SEEN IN AN INVERTING
TELESCOPE



The central circle represents the planet

GREENWICH MEAN TIME OF GREATEST NORTHERN ELONGATION

ARIEL			UMBRIEL		TITANIA	OBERON
Jan. 2 09.5	July 30 13.7	Oct. 16 16.8	Jan. 2 22.1	Aug. 27 02.7	Jan. 5 18.0	Jan. 10 12.6
4 21.9	Aug. 2 02.2	19 05.3	7 01.6	31 06.2	14 10.9	23 23.7
7 10.4	4 14.7	21 17.8	11 05.0	Sept. 4 09.6	23 03.9	Feb. 6 10.8
9 22.9	7 03.2	24 06.3	15 08.5	8 13.1	31 20.8	...
12 11.4	9 15.7	26 18.8	19 12.0	12 16.6	Feb. 9 13.7	...
14 23.9	12 04.2	29 07.3	23 15.4	16 20.0	...	...
17 12.4	14 16.6	31 19.8	27 18.9	20 23.5	...	...
20 00.9	17 05.1	Nov. 3 08.3	31 22.4	25 03.0	...	...
22 13.4	19 17.6	5 20.8	Feb. 5 01.8	29 06.4	...	...
25 01.9	22 06.1	8 09.3	9 05.3	Oct. 3 09.9	...	...
27 14.4	24 18.6	10 21.8	...	7 13.4	July 7 12.7	...
30 02.9	27 07.1	13 10.3	...	11 16.8	16 05.5	...
Feb. 1 15.4	29 19.6	15 22.8	...	15 20.3	24 22.4	...
4 03.9	Sept. 1 08.0	18 11.3	...	19 23.8	Aug. 2 15.3	...
6 16.4	3 20.5	20 23.8	...	24 03.2	11 08.3	...
9 04.9	6 09.0	23 12.3	...	28 06.7	20 01.2	...
...	8 21.5	26 00.8	...	Nov. 1 10.2	28 18.1	...
...	11 10.0	28 13.2	...	5 13.7	Sept. 6 11.1	July 4 11.5
...	13 22.5	Dec. 1 01.7	July 4 05.9	9 17.1	15 04.0	17 22.5
...	16 11.0	3 14.2	8 09.3	13 20.6	23 21.0	31 09.5
...	18 23.4	6 02.7	12 12.8	18 00.1	Oct. 2 14.0	Aug. 13 20.6
July 5 08.9	21 11.9	8 15.2	16 16.2	22 03.6	11 07.0	27 07.7
7 21.4	24 00.4	11 03.7	20 19.7	26 07.0	20 00.0	Sept. 9 18.9
10 09.9	26 12.9	13 16.2	24 23.1	30 10.5	28 17.0	23 06.1
12 22.4	29 01.4	16 04.7	29 02.6	Dec. 4 14.0	Nov. 6 10.0	Oct. 6 17.3
15 10.9	Oct. 1 13.9	18 17.2	Aug. 2 06.0	8 17.5	15 03.0	20 04.5
17 23.4	4 02.4	21 05.7	6 09.5	12 20.9	23 19.9	Nov. 2 15.8
20 11.8	6 14.9	23 18.2	10 12.9	17 00.4	Dec. 2 12.9	16 03.0
23 00.3	9 03.4	26 06.7	14 16.4	21 03.9	11 05.9	29 14.3
25 12.8	11 15.9	28 19.2	18 19.8	25 07.4	19 22.9	Dec. 13 01.5
28 01.3	14 04.4	31 07.7	22 23.3	29 10.8	28 15.9	26 12.7

Sidereal period of Ariel, 2^d 12^h.489; of Umbriel, 4^d 03^h.460; of Titania, 8^d 16^h.941; of Oberon, 13^d 11^h.118

Time from Northern Elongation	ARIEL		UMBRIEL		Time from Northern Elongation	TITANIA		Time from Northern Elongation	OBERON	
	p^1	F	p^1	F		p^1	F		p^1	F
d h					d h			d h		
0 00	351.0	1.000	351.0	1.000	0 00	351.0	1.000	0 00	351.0	1.000
0 02	342.4	0.990	345.8	0.996	0 05	344.8	0.994	0 08	344.6	0.994
0 04	333.4	0.960	340.5	0.985	0 10	338.4	0.978	0 16	337.9	0.977
0 06	323.6	0.914	335.0	0.966	0 15	331.8	0.953	1 00	331.0	0.950
0 08	312.7	0.859	329.3	0.942	0 20	324.7	0.920	1 08	323.7	0.915
0 10	300.2	0.802	323.2	0.912	1 01	317.0	0.881	1 16	315.6	0.874
0 12	286.0	0.754	316.7	0.879	1 06	308.6	0.839	2 00	306.8	0.831
0 14	270.2	0.726	309.6	0.844	1 11	299.3	0.798	2 08	297.0	0.789
0 16	253.8	0.724	302.0	0.809	1 16	289.1	0.763	2 16	286.1	0.754
0 18	237.9	0.749	293.7	0.778	1 21	278.0	0.736	3 00	274.5	0.731
0 20	223.4	0.795	284.8	0.751	2 02	266.3	0.723	3 08	262.2	0.721
0 22	210.7	0.852	275.2	0.732	2 07	254.4	0.723	3 16	249.9	0.727
1 00	199.7	0.908	265.2	0.722	2 12	242.7	0.738	4 00	238.1	0.749
1 02	189.8	0.955	255.3	0.723	2 17	231.7	0.766	4 08	227.1	0.782
1 04	180.7	0.987	245.4	0.734	2 22	221.6	0.803	4 16	217.1	0.822
1 06	172.0	1.000	236.0	0.754	3 03	212.4	0.844	5 00	208.0	0.865
1 08	163.4	0.992	227.1	0.782	3 08	204.1	0.885	5 08	199.9	0.907
1 10	154.5	0.965	218.9	0.814	3 13	196.6	0.924	5 16	192.4	0.944
1 12	144.9	0.921	211.4	0.849	3 18	189.5	0.956	6 00	185.4	0.973
1 14	134.1	0.866	204.4	0.884	3 23	182.9	0.981	6 08	178.7	0.992
1 16	121.8	0.809	198.0	0.917	4 04	176.6	0.996	6 16	172.3	1.000
1 18	107.8	0.759	192.0	0.946	4 09	170.3	1.000	7 00	165.8	0.996
1 20	92.2	0.728	186.3	0.969	4 14	164.1	0.993	7 08	159.3	0.981
1 22	75.8	0.722	180.8	0.987	4 19	157.7	0.976	7 16	152.4	0.956
2 00	59.7	0.745	175.5	0.997	5 00	151.0	0.950	8 00	145.1	0.922
2 02	45.1	0.789	170.3	1.000	5 05	143.9	0.916	8 08	137.2	0.882
2 04	32.2	0.845	165.1	0.995	5 10	136.2	0.876	8 16	128.6	0.839
2 06	20.9	0.902	159.7	0.983	5 15	127.7	0.835	9 00	119.0	0.797
2 08	10.9	0.950	154.2	0.964	5 20	118.3	0.794	9 08	108.3	0.760
2 10	1.8	0.984	148.5	0.938	6 01	108.0	0.760	9 16	96.8	0.734
2 12	353.1	0.999	142.3	0.908	6 06	96.8	0.734	10 00	84.6	0.722
2 14	344.5	0.994	135.8	0.874	6 11	85.1	0.722	10 08	72.3	0.725
2 16			128.7	0.839	6 16	73.1	0.724	10 16	60.3	0.744
2 18			120.9	0.805	6 21	61.5	0.741	11 00	49.2	0.775
2 20			112.5	0.773	7 02	50.6	0.770	11 08	38.9	0.814
2 22			103.5	0.748	7 07	40.6	0.807	11 16	29.7	0.857
3 00			93.9	0.730	7 12	31.5	0.848	12 00	21.4	0.899
3 02			84.0	0.721	7 17	23.3	0.890	12 08	13.8	0.937
3 04			74.0	0.724	7 22	15.8	0.927	12 16	6.7	0.968
3 06			64.1	0.736	8 03	8.8	0.959	13 00	0.0	0.989
3 08			54.8	0.757	8 08	2.2	0.983	13 08	353.5	0.999
3 10			46.0	0.786	8 13	355.9	0.996	13 16	347.1	0.998
3 12			37.9	0.819	8 18	349.7	1.000			
3 14			30.4	0.853						
3 16			23.5	0.888						
3 18			17.1	0.921						
3 20			11.2	0.949						
3 22			5.5	0.972						
4 00			0.1	0.988						
4 02			354.8	0.998						
4 04			349.6	1.000						

Position angle of satellite $p = p^1 + (P - P_0)$

Apparent distance of satellite $s = F \frac{a(\Delta)}{\Delta}$

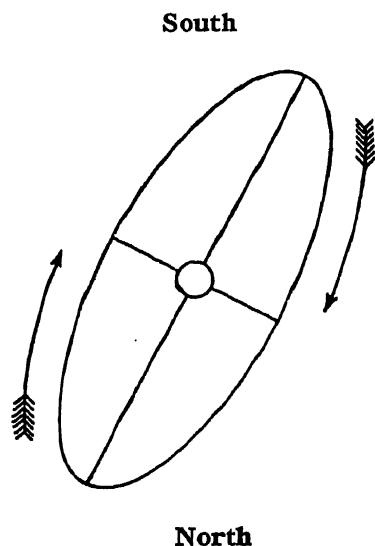
SATELLITES OF URANUS, 1935

Date	$P-P_0$	$\frac{a(\Delta)}{\Delta}$				Date	$P-P_0$	$\frac{a(\Delta)}{\Delta}$			
		Ariel	Um- briel	Tit- ania	Obe- ron			Ariel	Um- briel	Tit- ania	Obe- ron
Jan. 1	-2.0	13.5	18.9	30.9	41.4	Sept. 3	+0.8	13.7	19.1	31.4	42.0
11	2.0	13.4	18.7	30.7	41.0	13	0.8	13.8	19.3	31.6	42.3
21	2.0	13.3	18.5	30.4	40.7	23	0.6	13.9	19.4	31.8	42.5
31	2.0	13.2	18.4	30.2	40.3	Oct. 3	0.5	14.0	19.5	31.9	42.7
Feb. 10	-1.9	13.1	18.2	29.9	40.0	13	0.3	14.0	19.5	32.0	42.8
...	...	...	...	...	...	23	+0.2	14.0	19.6	32.1	42.9
...	...	...	...	...	...	Nov. 2	0.0	14.0	19.6	32.1	42.9
July 5	+0.7	13.1	18.2	29.9	40.0	12	-0.1	14.0	19.5	32.0	42.8
15	0.8	13.2	18.4	30.1	40.3	22	0.3	14.0	19.5	31.9	42.7
25	0.9	13.3	18.5	30.4	40.6	Dec. 2	0.4	13.9	19.4	31.8	42.5
Aug. 4	+0.9	13.4	18.7	30.7	41.0	12	-0.5	13.8	19.2	31.6	42.2
14	0.9	13.5	18.8	30.9	41.3	22	0.6	13.7	19.1	31.4	42.0
24	+0.9	13.6	19.0	31.2	41.7	32	-0.6	13.6	19.0	31.1	41.6

SATELLITE OF NEPTUNE, 1935

Time from Eastern Elongation		p^1	F	Time from Eastern Elongation		p^1	F	Date	$P-P_0$	$\frac{a(\Delta)}{\Delta}$
d h	°			d h	°					
0 00	150.0	1.000		3 00	328.5	0.998		Jan. 1	+0.8	16.5
0 03	147.0	0.992		3 03	325.5	0.983		11	0.8	16.5
0 06	143.9	0.970		3 06	322.3	0.954		21	0.7	16.6
0 09	140.5	0.933		3 09	318.8	0.910		31	0.6	16.7
0 12	136.9	0.883		3 12	314.9	0.855		Feb. 10	0.5	16.7
0 15	132.8	0.822		3 15	310.5	0.788		20	+0.4	16.8
0 18	127.9	0.751		3 18	305.1	0.713		Mar. 2	0.2	16.8
0 21	121.9	0.672		3 21	298.4	0.633		12	+0.1	16.8
1 00	114.4	0.592		4 00	289.8	0.553		22	0.0	16.8
1 03	104.4	0.514		4 03	278.4	0.479		Apr. 1	-0.1	16.7
1 06	91.3	0.447		4 06	263.4	0.423		11	-0.2	16.7
1 09	74.4	0.404		4 09	245.1	0.395		21	0.3	16.6
1 12	55.2	0.394		4 12	225.9	0.404		May 1	0.4	16.5
1 15	36.9	0.422		4 15	209.0	0.447		11	0.4	16.4
1 18	21.8	0.478		4 18	195.7	0.513		21	0.4	16.4
1 21	10.3	0.551		4 21	185.8	0.590		31	-0.4	16.3
2 00	1.7	0.632		5 00	178.2	0.671		June 10	0.4	16.2
2 03	355.0	0.712		5 03	172.2	0.750		20	0.4	16.1
2 06	349.6	0.787		5 06	167.3	0.821		30	0.3	16.0
2 09	345.1	0.853		5 09	163.2	0.883		July 10	-0.2	15.9
2 12	341.3	0.909		5 12	159.5	0.933		Nov. 22	+1.6	16.1
2 15	337.8	0.953		5 15	156.2	0.970		Dec. 2	1.7	16.2
2 18	334.6	0.983		5 18	153.1	0.992		12	1.8	16.2
2 21	331.5	0.998		5 21	150.0	1.000		22	1.8	16.3
3 00	328.5	0.998		6 00	147.0	0.992		32	+1.7	16.4

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION, MARCH 4, AS SEEN IN AN INVERTING TELESCOPE



The central circle represents the planet

GREENWICH MEAN TIME OF GREATEST EASTERN ELONGATION

Jan. 4 00.8	Mar. 9 16.7	May 13 08.7	July 17 00.1	Oct. 30 17.7
9 21.9	15 13.8	19 05.8	22 21.1	Nov. 5 14.7
15 19.0	21 10.9	25 02.9	28 18.1	11 11.7
21 16.0	27 08.0	30 23.9	Aug. 3 15.1	17 08.7
27 13.1	Apr. 2 05.1	June 5 21.0	...	23 05.7
Feb. 2 10.2	8 02.2	11 18.0	...	29 02.7
8 07.2	13 23.3	17 15.0	...	Dec. 4 23.7
14 04.4	19 20.4	23 12.1	Oct. 7 05.8	10 20.7
20 01.4	25 17.5	29 09.1	13 02.8	16 17.8
25 22.5	May 1 14.6	July 5 06.1	18 23.8	22 14.8
Mar. 3 19.6	7 11.6	11 03.1	24 20.7	28 11.8

The sidereal period of the satellite of Neptune is $5^d 21^h.044$

Position angle of satellite $p = p^1 + (P - P_0)$

Apparent distance of satellite $s = F \frac{a(\Delta)}{\Delta}$

	d	h		d	h		d	h		d	h	
Jan.	1	09	21 6 (... 21 6° N.	May	5	23	♀ 6 (... ♀ 0.6 S.					
	2		Earth in Perihelion		10		21 8 ☉					
	5	11	☉ eclipsed		12	14	♂ 6 (... ♂ 5 N.					
	6		♀ 6 (... ♀ 0.8 S.		14	16	♂ 6 (... ♂ 7 N.					
	6	02	♂ Stationary		17	20	21 6 (... 21 6 N.					
	8	02	♀ 6 (... ♀ 0.8 S.		19		♂ Stationary					
	12	13	♂ 6 (... ♂ 4 S.		24		♀ Stationary					
	19		♂ 6 (... ♂ 6 S.		26		♀ at greatest elongation 23 E.					
	23	16	(eclipsed		26	00	♂ 6 (... ♂ 6 S.					
	26	18	♀ 6 (... ♀ 5 N.		29	19	♂ 6 (... ♂ 6 S.					
	29	01	♀ 6 ♀ ... ♀ 0.6 N.	June	3	02	♀ 6 (... ♀ 0.9 S.					
	31	10	21 6 (... 21 6 N.		5	02	♀ 6 (... ♀ 3 N.					
	31	12	♀ 6 ♂ ... ♀ 1.5 N.		8	23	♂ 6 (... ♂ 5 N.					
	31	23	♀ 6 ♀ ... ♀ 0.2 S.		9		♀ Stationary					
Feb.	1		♀ 6 ♀ ... ♀ 1.8 N.		11	06	♂ 6 (... ♂ 6 N.					
	3		♀ at greatest elongation 18 E.		14	00	21 6 (... 21 6 N.					
	4	18	☉ eclipsed		21		♀ Inf. 6 ☉					
	4	23	♂ 6 (... ♂ 2 S.		22		♂ Stationary					
	5	03	♀ 6 (... ♀ 5 S.		22	07	♂ 6 (... ♂ 6 S.					
	7		♀ Stationary		22	09	☉ enters Sign ♊, Solstice					
	8	21	♂ 6 (... ♂ 6 S.		26	04	♂ 6 (... ♂ 6 S.					
	17		♀ Inf. 6 ☉		29	21	♀ 6 (... ♀ 7 S.					
	19	21	♀ 6 (... ♀ 5 N.		30		☉ eclipsed					
	20		♂ 6 ☉		30		♀ at greatest elongation 45 E.					
	25	12	21 6 (... 21 6 N.	July	3		♀ Stationary					
	27		♂ Stationary		4		Earth in Aphelion					
Mar.	1		♀ Stationary		5	00	♀ 6 (... ♀ 4 N.					
	3	12	♀ 6 (... ♀ 0.1 S.		6	07	♂ 6 (... ♂ 6 N.					
	4		♀ 6 ☉		9	10	♂ 6 (... ♂ 5 N.					
	4	11	♂ 6 (... ♂ 5 S.		11	07	21 6 (... 21 6 N.					
	7	03	♀ 6 (... ♀ 6 S.		12		21 Stationary					
	8	08	♂ 6 (... ♂ 6 S.		14		♀ at greatest elongation 21 W.					
	10		21 Stationary		16		(eclipsed					
	15		♀ at greatest elongation 28 W.		19	13	♂ 6 (... ♂ 6 S.					
	19	02	♀ 6 (... ♀ 5 N.		23	10	♂ 6 (... ♂ 6 S.					
	21	13	☉ enters Sign ♋, Equinox		25	06	♀ 6 ♀ ... ♀ 2.6 S.					
	22	07	♀ 6 ♀ ... ♀ 0.4 N.		29	06	♀ 6 (... ♀ 0.6 N.					
	22	09	♀ 6 ♂ ... ♀ 0.3 S.		30		☉ eclipsed					
	24	17	21 6 (... 21 6 N.	Aug.	2	16	♀ 6 (... ♀ 6 N.					
Apr.	1	03	♂ 6 (... ♂ 5 S.		3		♀ at greatest brilliancy					
	6	00	♀ 6 (... ♀ 4 S.		3	01	♀ 6 (... ♀ 2 N.					
	6		♂ 6 ☉		6	22	♂ 6 (... ♂ 4 N.					
	15	07	♀ 6 (... ♀ 5 N.		7	18	21 6 (... 21 6 N.					
	20	19	21 6 (... 21 6 N.		10		♀ Sup. 6 ☉					
	22		♂ 6 ☉		11		♂ Stationary					
	25	06	♀ 6 ♀ ... ♀ 0.2 S.		15		♀ Stationary					
	27		♀ Sup. 6 ☉		15	20	♂ 6 (... ♂ 6 S.					
	28	15	♂ 6 (... ♂ 5 S.		19	17	♂ 6 (... ♂ 6 S.					
May	3	13	♀ 6 (... ♀ 4 S.		24	10	♀ 6 ♀ ... ♀ 0.1 N.					
					27	23	♂ 6 21 ... ♂ 2.2 S.					

	d	h		°			d	h		°
Aug. 30	05		♀	♂	(	...	♀	4	S.	
30	22		♀	♂	(	...	♀	5	N.	
31			♂	♂	⊙					
Sept. 4	06		♂	♂	(	...	♂	6	N.	
4	13		♂	♂	(	...	♂	3	N.	
7			♂	♂	⊙					
8			♀	Inf.	♂	⊙				
12	03		♂	♂	(	...	♂	6	S.	
16	01		♂	♂	(	...	♂	6	S.	
23			♀	at greatest elongation			26	E.		
24	00		⊙	enters Sign	♈	Equinox				
25	09		♀	♂	(	...	♀	4	S.	
27			♀	Stationary						
30	01		♀	♂	(	...	♀	2	N.	
Oct. 1	20		♂	♂	(	...	♂	5	N.	
3	07		♂	♂	(	...	♂	2	N.	
6			♀	Stationary						
9	11		♂	♂	(	...	♂	6	S.	
13	10		♂	♂	(	...	♂	6	S.	
15			♀	at greatest brilliancy						
18			♀	Inf.	♂	⊙				
23	14		♀	♂	(	...	♀	3	N.	
23	17		♂	♂	(	...	♂	6	N.	
25	01		♀	♂	♂	...	♀	2.6	S.	
26			♀	Stationary						
26	08		♀	♂	(	...	♀	7	N.	
Oct. 27			♂	♂	⊙					
29	12		♂	♂	(	...	♂	4	N.	
Nov. 1	03		♂	♂	(	...	♂	0.4	S.	
2			♀	at greatest elongation			19	W.		
5	18		♂	♂	(	...	♂	6	S.	
8			♂	Stationary						
9	18		♂	♂	(	...	♂	6	S.	
18			♀	at greatest elongation			47	W.		
20	01		♂	♂	(	...	♂	6	N.	
25	12		♀	♂	(	...	♀	4	N.	
26	06		♂	♂	(	...	♂	4	N.	
27			♂	♂	⊙					
30	01		♂	♂	(	...	♂	2	S.	
Dec. 2	18		♂	♂	♂	...	♀	1.0	S.	
3	01		♂	♂	(	...	♂	6	S.	
7	02		♂	♂	(	...	♂	6	S.	
10			♀	Sup.	♂	⊙				
17	10		♂	♂	(	...	♂	6	N.	
20			♂	Stationary						
22	19		⊙	enters Sign	♏	Solstice				
24	01		♂	♂	(	...	♂	3	N.	
25			⊙	eclipsed						
26	12		♀	♂	(	...	♀	2	S.	
29	00		♂	♂	(	...	♂	4	S.	
30	10		♂	♂	(	...	♂	7	S.	

MERCURY ♀

Greatest Elongation E. ...	Feb. 1	May 26	Sept. 23
Stationary ...	Feb. 7	June 9	Oct. 6
Inferior Conjunction ...	Feb. 17	June 21	Oct. 18
Stationary ...	Mar. 1	July 3	Oct. 26
Greatest Elongation W. ...	Mar. 15	July 14	Nov. 2
Superior Conjunction ...	Apr. 27	Aug. 10	Dec. 10

VENUS ♀

Greatest Elongation E. ...	June 30	Inferior Conjunction ...	Sept. 8
Greatest Elongation W. ...	Nov. 18	Stationary ...	Aug. 15 Sept. 27
Greatest Brilliancy ...	Aug. 3	Oct. 15	

EARTH ⊕

Perihelion ...	Jan. 2	Equinoxes ...	Mar. 21 ^d 13 ^h Sept. 24 ^d 00 ^h
Aphelion ...	July 4	Solstices ...	June 22 09 Dec. 22 19

SUPERIOR PLANETS

	Conjunction ♂	Opposition ♂	Stationary
Mars ♂	...	Apr. 6	Feb. 27 May 19
Jupiter ♃	...	May 10	Mar. 10 July 12
Saturn ♄	...	Aug. 31	June 22 Nov. 8
Uranus ♅	...	Oct. 27	Jan. 6 Aug. 11
Neptune ♆	...	Mar. 4	May 24 Dec. 20

LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), AND BEGINNING OF MORNING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat.		0°	+ 10°	+ 20°	+ 30°	+ 35°	+ 40°	+ 45°	+ 50°	+ 52°	+ 54°	+ 56°	+ 58°	+ 60°
Date														
Jan.	1	5 59	6 17	6 35	6 56	7 08	7 22	7 38	7 59	8 08	8 19	8 32	8 46	9 03
	2	6 00	6 17	6 35	6 56	7 08	7 22	7 39	7 59	8 08	8 19	8 32	8 46	9 03
	3	6 00	6 18	6 36	6 56	7 08	7 22	7 39	7 59	8 08	8 19	8 31	8 46	9 02
	4	6 01	6 18	6 36	6 57	7 09	7 22	7 39	7 59	8 08	8 19	8 31	8 45	9 02
	5	6 01	6 18	6 36	6 57	7 09	7 22	7 38	7 58	8 08	8 18	8 30	8 44	9 01
	6	6 02	6 19	6 36	6 57	7 09	7 22	7 38	7 58	8 08	8 18	8 30	8 44	9 00
	7	6 02	6 19	6 37	6 57	7 09	7 22	7 38	7 58	8 07	8 18	8 30	8 43	8 59
	8	6 03	6 19	6 37	6 57	7 09	7 22	7 38	7 58	8 07	8 17	8 29	8 42	8 58
	9	6 03	6 20	6 37	6 57	7 09	7 22	7 38	7 57	8 06	8 16	8 28	8 42	8 57
	10	6 04	6 20	6 37	6 57	7 09	7 22	7 38	7 57	8 06	8 16	8 28	8 41	8 56
	11	6 04	6 20	6 38	6 57	7 09	7 22	7 37	7 56	8 05	8 15	8 27	8 40	8 55
	12	6 04	6 20	6 38	6 57	7 09	7 22	7 37	7 56	8 05	8 14	8 26	8 39	8 54
	13	6 05	6 21	6 38	6 57	7 08	7 21	7 36	7 55	8 04	8 14	8 25	8 38	8 52
	14	6 05	6 21	6 38	6 57	7 08	7 21	7 36	7 54	8 03	8 13	8 24	8 36	8 51
	15	6 06	6 21	6 38	6 57	7 08	7 21	7 36	7 54	8 02	8 12	8 23	8 35	8 50
	16	6 06	6 21	6 38	6 57	7 08	7 20	7 35	7 53	8 02	8 11	8 22	8 34	8 48
	17	6 06	6 22	6 38	6 57	7 08	7 20	7 34	7 52	8 01	8 10	8 21	8 33	8 47
	18	6 07	6 22	6 38	6 56	7 07	7 19	7 34	7 51	8 00	8 09	8 19	8 31	8 45
	19	6 07	6 22	6 38	6 56	7 07	7 19	7 33	7 50	7 59	8 08	8 18	8 30	8 43
	20	6 07	6 22	6 38	6 56	7 06	7 18	7 32	7 49	7 58	8 06	8 17	8 28	8 42
	21	6 08	6 22	6 38	6 56	7 06	7 18	7 32	7 48	7 57	8 05	8 15	8 27	8 40
	22	6 08	6 22	6 38	6 56	7 06	7 17	7 31	7 47	7 56	8 04	8 14	8 25	8 38
	23	6 08	6 23	6 38	6 55	7 05	7 17	7 30	7 46	7 54	8 03	8 12	8 23	8 36
	24	6 08	6 23	6 38	6 55	7 05	7 16	7 29	7 45	7 53	8 01	8 11	8 22	8 34
	25	6 09	6 23	6 38	6 54	7 04	7 15	7 28	7 44	7 52	8 00	8 09	8 20	8 32
	26	6 09	6 23	6 37	6 54	7 04	7 15	7 28	7 43	7 50	7 59	8 08	8 18	8 30
	27	6 09	6 23	6 37	6 54	7 03	7 14	7 27	7 42	7 49	7 57	8 06	8 16	8 28
	28	6 09	6 23	6 37	6 53	7 02	7 13	7 26	7 41	7 48	7 56	8 04	8 14	8 26
	29	6 10	6 23	6 37	6 53	7 02	7 12	7 25	7 40	7 46	7 54	8 03	8 12	8 24
	30	6 10	6 23	6 36	6 52	7 01	7 12	7 24	7 38	7 45	7 52	8 01	8 10	8 21
	31	6 10	6 23	6 36	6 52	7 00	7 11	7 22	7 37	7 43	7 51	7 59	8 08	8 19
Feb.	1	6 10	6 23	6 36	6 51	7 00	7 10	7 21	7 35	7 42	7 49	7 57	8 06	8 17
	2	6 10	6 22	6 36	6 50	6 59	7 09	7 20	7 34	7 40	7 47	7 55	8 04	8 14
	3	6 10	6 22	6 35	6 50	6 58	7 08	7 19	7 32	7 39	7 46	7 53	8 02	8 12
	4	6 10	6 22	6 35	6 49	6 58	7 07	7 18	7 31	7 37	7 44	7 51	8 00	8 10
	5	6 10	6 22	6 35	6 49	6 57	7 06	7 17	7 30	7 36	7 42	7 49	7 58	8 07
	6	6 10	6 22	6 34	6 48	6 56	7 05	7 15	7 28	7 34	7 40	7 47	7 56	8 05
	7	6 11	6 22	6 34	6 47	6 55	7 04	7 14	7 26	7 32	7 38	7 45	7 53	8 02

BEGINNING OF MORNING TWILIGHT

Jan.	1	4 45	5 01	5 16	5 31	5 38	5 45	5 52	6 00	6 03	6 07	6 10	6 14	6 18
	11	4 50	5 06	5 20	5 33	5 39	5 45	5 52	5 59	6 02	6 05	6 08	6 11	6 15
	21	4 54	5 09	5 21	5 32	5 38	5 43	5 48	5 54	5 56	5 58	6 01	6 03	6 06
Feb.	31	4 58	5 10	5 20	5 30	5 34	5 38	5 41	5 45	5 46	5 47	5 49	5 50	5 51
	10	5 00	5 10	5 18	5 24	5 27	5 29	5 31	5 32	5 32	5 32	5 32	5 32	5 32

SUNSET, 1935

643

LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), AND ENDING OF EVENING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Jan.	1	18 07	17 50	17 32	17 11	16 59	16 45	16 28	16 08	15 58	15 48	15 35	15 21	15 04
	2	18 08	17 51	17 32	17 12	17 00	16 46	16 29	16 09	15 59	15 49	15 36	15 22	15 05
	3	18 08	17 51	17 33	17 12	17 00	16 46	16 30	16 10	16 00	15 50	15 38	15 24	15 07
	4	18 08	17 51	17 34	17 13	17 01	16 47	16 31	16 11	16 02	15 51	15 39	15 25	15 08
	5	18 09	17 52	17 34	17 14	17 02	16 48	16 32	16 12	16 03	15 52	15 40	15 26	15 10
	6	18 09	17 53	17 35	17 14	17 03	16 49	16 33	16 13	16 04	15 54	15 42	15 28	15 12
	7	18 10	17 53	17 36	17 15	17 04	16 50	16 34	16 14	16 05	15 55	15 43	15 30	15 14
	8	18 10	17 54	17 36	17 16	17 04	16 51	16 35	16 16	16 07	15 56	15 45	15 31	15 15
	9	18 11	17 54	17 37	17 17	17 05	16 52	16 36	16 17	16 08	15 58	15 46	15 33	15 17
	10	18 11	17 55	17 38	17 18	17 06	16 53	16 38	16 18	16 09	15 59	15 48	15 35	15 19
	11	18 12	17 55	17 38	17 18	17 07	16 54	16 39	16 20	16 11	16 01	15 50	15 36	15 21
	12	18 12	17 56	17 39	17 19	17 08	16 55	16 40	16 21	16 12	16 02	15 51	15 38	15 23
	13	18 12	17 56	17 39	17 20	17 09	16 56	16 41	16 22	16 14	16 04	15 53	15 40	15 26
	14	18 13	17 57	17 40	17 21	17 10	16 57	16 42	16 24	16 15	16 06	15 55	15 42	15 28
	15	18 13	17 57	17 41	17 22	17 11	16 58	16 43	16 25	16 17	16 07	15 56	15 44	15 30
	16	18 13	17 58	17 41	17 23	17 12	16 59	16 45	16 27	16 18	16 09	15 58	15 46	15 32
	17	18 14	17 58	17 42	17 24	17 13	17 00	16 46	16 28	16 20	16 11	16 00	15 48	15 34
	18	18 14	17 59	17 43	17 24	17 14	17 02	16 47	16 30	16 22	16 12	16 02	15 50	15 37
	19	18 14	17 59	17 43	17 25	17 15	17 03	16 49	16 31	16 23	16 14	16 04	15 52	15 39
	20	18 14	18 00	17 44	17 26	17 16	17 04	16 50	16 33	16 25	16 16	16 06	15 55	15 41
	21	18 15	18 00	17 45	17 27	17 17	17 05	16 51	16 34	16 26	16 18	16 08	15 57	15 44
	22	18 15	18 01	17 45	17 28	17 18	17 06	16 52	16 36	16 28	16 20	16 10	15 59	15 46
	23	18 16	18 01	17 46	17 29	17 19	17 07	16 54	16 38	16 30	16 22	16 12	16 01	15 49
	24	18 16	18 02	17 47	17 30	17 20	17 08	16 55	16 39	16 32	16 24	16 14	16 04	15 51
	25	18 16	18 02	17 47	17 30	17 21	17 10	16 57	16 41	16 34	16 25	16 16	16 06	15 54
	26	18 16	18 02	17 48	17 31	17 22	17 11	16 58	16 43	16 35	16 27	16 18	16 08	15 56
	27	18 16	18 03	17 48	17 32	17 23	17 12	16 59	16 44	16 37	16 29	16 20	16 10	15 59
	28	18 17	18 03	17 49	17 33	17 24	17 13	17 01	16 46	16 39	16 31	16 22	16 13	16 01
	29	18 17	18 04	17 50	17 34	17 25	17 14	17 02	16 48	16 41	16 33	16 24	16 15	16 04
	30	18 17	18 04	17 50	17 35	17 26	17 16	17 04	16 49	16 42	16 35	16 27	16 17	16 06
Feb.	31	18 17	18 04	17 51	17 36	17 27	17 17	17 05	16 51	16 44	16 37	16 29	16 20	16 09
	1	18 17	18 05	17 52	17 36	17 28	17 18	17 06	16 53	16 46	16 39	16 31	16 22	16 12
	2	18 17	18 05	17 52	17 37	17 29	17 19	17 08	16 54	16 48	16 41	16 33	16 24	16 14
	3	18 18	18 05	17 53	17 38	17 30	17 20	17 09	16 56	16 50	16 43	16 35	16 27	16 17
	4	18 18	18 06	17 53	17 39	17 31	17 22	17 11	16 58	16 52	16 45	16 38	16 29	16 20
	5	18 18	18 06	17 54	17 40	17 32	17 23	17 12	17 00	16 54	16 47	16 40	16 32	16 22
	6	18 18	18 06	17 54	17 41	17 33	17 24	17 14	17 01	16 55	16 49	16 42	16 34	16 25
	7	18 18	18 07	17 55	17 42	17 34	17 25	17 15	17 03	16 57	16 51	16 44	16 36	16 28

ENDING OF EVENING TWILIGHT

Jan.	1	19 22	19 05	18 50	18 36	18 29	18 22	18 15	18 07	18 04	18 00	17 57	17 53	17 49
	11	19 26	19 10	18 56	18 44	18 37	18 31	18 24	18 17	18 14	18 12	18 08	18 05	18 02
	21	19 28	19 14	19 02	18 51	18 45	18 40	18 35	18 30	18 28	18 25	18 23	18 21	18 18
	31	19 29	19 17	19 07	18 58	18 54	18 50	18 47	18 44	18 42	18 41	18 40	18 39	18 38
Feb.	10	19 29	19 19	19 12	19 05	19 03	19 01	19 00	18 59	18 58	18 58	18 59	18 59	18 59

LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), AND BEGINNING OF MORNING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Feb. 7	6 11	6 22	6 34	6 47	6 55	7 04	7 14	7 26	7 32	7 38	7 45	7 53	8 02
8	6 11	6 22	6 33	6 47	6 54	7 03	7 13	7 25	7 30	7 36	7 43	7 51	8 00
9	6 11	6 22	6 33	6 46	6 53	7 02	7 11	7 23	7 28	7 34	7 41	7 49	7 57
10	6 11	6 21	6 32	6 45	6 52	7 00	7 10	7 22	7 27	7 33	7 39	7 46	7 55
11	6 11	6 21	6 32	6 44	6 51	6 59	7 09	7 20	7 25	7 31	7 37	7 44	7 52
12	6 11	6 21	6 32	6 44	6 50	6 58	7 07	7 18	7 23	7 28	7 35	7 42	7 49
13	6 11	6 21	6 31	6 43	6 49	6 57	7 06	7 16	7 21	7 26	7 32	7 39	7 47
14	6 11	6 20	6 30	6 42	6 48	6 56	7 04	7 15	7 19	7 24	7 30	7 37	7 44
15	6 11	6 20	6 30	6 41	6 47	6 54	7 03	7 13	7 17	7 22	7 28	7 34	7 41
16	6 11	6 20	6 29	6 40	6 46	6 53	7 01	7 11	7 15	7 20	7 26	7 32	7 39
17	6 11	6 20	6 29	6 39	6 45	6 52	7 00	7 09	7 14	7 18	7 23	7 29	7 36
18	6 11	6 19	6 28	6 38	6 44	6 51	6 58	7 07	7 12	7 16	7 21	7 27	7 33
19	6 11	6 19	6 28	6 37	6 43	6 49	6 57	7 05	7 10	7 14	7 19	7 24	7 30
20	6 10	6 19	6 27	6 36	6 42	6 48	6 55	7 04	7 07	7 12	7 16	7 22	7 28
21	6 10	6 18	6 26	6 36	6 41	6 47	6 54	7 02	7 05	7 10	7 14	7 19	7 25
22	6 10	6 18	6 26	6 35	6 40	6 45	6 52	7 00	7 03	7 07	7 12	7 17	7 22
23	6 10	6 17	6 25	6 34	6 38	6 44	6 50	6 58	7 01	7 05	7 09	7 14	7 19
24	6 10	6 17	6 24	6 33	6 37	6 42	6 48	6 56	6 59	7 03	7 07	7 11	7 16
25	6 10	6 17	6 24	6 32	6 36	6 41	6 47	6 54	6 57	7 00	7 04	7 09	7 14
26	6 10	6 16	6 23	6 30	6 35	6 40	6 45	6 52	6 55	6 58	7 02	7 06	7 11
27	6 10	6 16	6 22	6 29	6 34	6 38	6 44	6 50	6 53	6 56	6 59	7 03	7 08
28	6 09	6 15	6 22	6 28	6 32	6 37	6 42	6 48	6 51	6 54	6 57	7 01	7 05
Mar. 1	6 09	6 15	6 21	6 27	6 31	6 35	6 40	6 46	6 48	6 51	6 54	6 58	7 02
2	6 09	6 14	6 20	6 26	6 30	6 34	6 38	6 44	6 46	6 49	6 52	6 55	6 59
3	6 09	6 14	6 19	6 25	6 28	6 32	6 37	6 42	6 44	6 47	6 49	6 53	6 56
4	6 09	6 14	6 18	6 24	6 27	6 31	6 35	6 40	6 42	6 44	6 47	6 50	6 53
5	6 08	6 13	6 18	6 23	6 26	6 29	6 33	6 38	6 40	6 42	6 44	6 47	6 50
6	6 08	6 12	6 17	6 22	6 25	6 28	6 31	6 36	6 37	6 40	6 42	6 44	6 47
7	6 08	6 12	6 16	6 21	6 23	6 26	6 30	6 33	6 35	6 37	6 39	6 42	6 44
8	6 08	6 12	6 15	6 20	6 22	6 25	6 28	6 31	6 33	6 35	6 37	6 39	6 41
9	6 08	6 11	6 14	6 18	6 20	6 23	6 26	6 29	6 30	6 32	6 34	6 36	6 38
10	6 07	6 10	6 14	6 17	6 19	6 21	6 24	6 27	6 28	6 30	6 31	6 33	6 35
11	6 07	6 10	6 13	6 16	6 18	6 20	6 22	6 25	6 26	6 27	6 29	6 30	6 32
12	6 07	6 09	6 12	6 15	6 16	6 18	6 20	6 23	6 24	6 25	6 26	6 28	6 29
13	6 06	6 09	6 11	6 14	6 15	6 17	6 18	6 20	6 21	6 22	6 24	6 25	6 26
14	6 06	6 08	6 10	6 13	6 14	6 15	6 17	6 18	6 19	6 20	6 21	6 22	6 23
15	6 06	6 08	6 09	6 11	6 12	6 14	6 15	6 16	6 17	6 18	6 18	6 19	6 20

BEGINNING OF MORNING TWILIGHT

Jan. 31	4 58	5 10	5 20	5 30	5 34	5 38	5 41	5 45	5 46	5 47	5 49	5 50	5 51
Feb. 10	5 00	5 10	5 18	5 24	5 27	5 29	5 31	5 32	5 32	5 32	5 32	5 32	5 32
20	5 00	5 08	5 13	5 16	5 17	5 17	5 18	5 15	5 14	5 13	5 12	5 10	5 08
Mar. 2	5 00	5 04	5 07	5 07	5 06	5 04	5 02	4 56	4 54	4 51	4 48	4 44	4 40
12	4 58	5 00	4 59	4 56	4 52	4 48	4 43	4 35	4 31	4 26	4 21	4 15	4 08
22	4 55	4 54	4 50	4 43	4 38	4 31	4 23	4 11	4 05	3 59	3 51	3 43	3 33

SUNSET, 1935

645

LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), AND ENDING OF EVENING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+ 10°	+ 20°	+ 30°	+ 35°	+ 40°	+ 45°	+ 50°	+ 52°	+ 54°	+ 56°	+ 58°	+ 60°
Feb. 7	18 18	18 07	17 55	17 42	17 34	17 25	17 15	17 03	16 57	16 51	16 44	16 36	16 28
8	18 18	18 07	17 55	17 42	17 35	17 26	17 16	17 05	16 59	16 53	16 46	16 39	16 30
9	18 18	18 07	17 56	17 43	17 36	17 28	17 18	17 06	17 01	16 55	16 49	16 41	16 33
10	18 18	18 08	17 56	17 44	17 37	17 29	17 19	17 08	17 03	16 57	16 51	16 44	16 35
11	18 18	18 08	17 57	17 45	17 38	17 30	17 21	17 10	17 05	16 59	16 53	16 46	16 38
12	18 18	18 08	17 58	17 46	17 39	17 31	17 22	17 12	17 07	17 01	16 55	16 48	16 41
13	18 18	18 08	17 58	17 46	17 40	17 32	17 24	17 13	17 08	17 03	16 57	16 51	16 43
14	18 18	18 08	17 58	17 47	17 41	17 34	17 25	17 15	17 10	17 05	17 00	16 53	16 46
15	18 18	18 08	17 59	17 48	17 42	17 35	17 26	17 17	17 12	17 07	17 02	16 56	16 49
16	18 18	18 09	17 59	17 49	17 43	17 36	17 28	17 18	17 14	17 09	17 04	16 58	16 51
17	18 18	18 09	18 00	17 50	17 44	17 37	17 29	17 20	17 16	17 11	17 06	17 00	16 54
18	18 18	18 09	18 00	17 50	17 45	17 38	17 31	17 22	17 18	17 13	17 08	17 03	16 56
19	18 18	18 09	18 01	17 51	17 46	17 40	17 32	17 24	17 20	17 15	17 10	17 05	16 59
20	18 17	18 10	18 01	17 52	17 47	17 41	17 34	17 25	17 22	17 17	17 13	17 07	17 02
21	18 17	18 10	18 02	17 53	17 48	17 42	17 35	17 27	17 23	17 19	17 15	17 10	17 04
22	18 17	18 10	18 02	17 53	17 48	17 43	17 36	17 29	17 25	17 21	17 17	17 12	17 07
23	18 17	18 10	18 03	17 54	17 49	17 44	17 38	17 30	17 27	17 23	17 19	17 14	17 09
24	18 17	18 10	18 03	17 55	17 50	17 45	17 39	17 32	17 29	17 25	17 21	17 17	17 12
25	18 17	18 10	18 03	17 56	17 51	17 46	17 40	17 34	17 31	17 27	17 23	17 19	17 14
26	18 17	18 10	18 04	17 56	17 52	17 47	17 42	17 35	17 32	17 29	17 26	17 22	17 17
27	18 16	18 10	18 04	17 57	17 53	17 49	17 43	17 37	17 34	17 31	17 28	17 24	17 20
28	18 16	18 10	18 04	17 58	17 54	17 50	17 44	17 39	17 36	17 33	17 30	17 26	17 22
Mar. 1	18 16	18 10	18 05	17 58	17 55	17 51	17 46	17 40	17 38	17 35	17 32	17 28	17 25
2	18 16	18 10	18 05	17 59	17 56	17 52	17 47	17 42	17 40	17 37	17 34	17 31	17 27
3	18 16	18 11	18 06	18 00	17 56	17 53	17 49	17 44	17 42	17 39	17 36	17 33	17 30
4	18 15	18 11	18 06	18 00	17 57	17 54	17 50	17 45	17 43	17 41	17 38	17 35	17 32
5	18 15	18 11	18 06	18 01	17 58	17 55	17 51	17 47	17 45	17 43	17 40	17 38	17 35
6	18 15	18 11	18 07	18 02	17 59	17 56	17 53	17 49	17 47	17 45	17 43	17 40	17 37
7	18 15	18 11	18 07	18 03	18 00	17 57	17 54	17 50	17 49	17 47	17 45	17 42	17 40
8	18 14	18 11	18 07	18 03	18 01	17 58	17 55	17 52	17 50	17 49	17 47	17 45	17 42
9	18 14	18 11	18 08	18 04	18 02	17 59	17 57	17 54	17 52	17 51	17 49	17 47	17 45
10	18 14	18 11	18 08	18 04	18 02	18 00	17 58	17 55	17 54	17 52	17 51	17 49	17 47
11	18 14	18 11	18 08	18 05	18 03	18 01	17 59	17 57	17 56	17 54	17 53	17 51	17 50
12	18 13	18 11	18 08	18 06	18 04	18 02	18 01	17 58	17 57	17 56	17 55	17 54	17 52
13	18 13	18 11	18 09	18 06	18 05	18 04	18 02	18 00	17 59	17 58	17 57	17 56	17 55
14	18 13	18 11	18 09	18 07	18 06	18 05	18 03	18 02	18 01	18 00	17 59	17 58	17 57
15	18 13	18 11	18 10	18 08	18 07	18 06	18 05	18 03	18 03	18 02	18 01	18 01	18 00

ENDING OF EVENING TWILIGHT

Jan. 31	19 29	19 17	19 07	18 58	18 54	18 50	18 47	18 44	18 42	18 41	18 40	18 39	18 38
Feb. 10	19 29	19 19	19 12	19 05	19 03	19 01	19 00	18 59	18 58	18 58	18 59	18 59	18 59
20	19 27	19 20	19 15	19 12	19 12	19 12	19 12	19 14	19 15	19 17	19 18	19 20	19 23
Mar. 2	19 25	19 21	19 19	19 19	19 20	19 22	19 26	19 30	19 33	19 36	19 39	19 43	19 48
12	19 22	19 21	19 22	19 26	19 29	19 33	19 39	19 47	19 51	19 56	20 01	20 08	20 15
22	19 19	19 21	19 25	19 32	19 38	19 45	19 54	20 06	20 11	20 18	20 26	20 35	20 46

SUNRISE, 1935

LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), AND BEGINNING OF MORNING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Mar. 15	6 06	6 08	6 09	6 11	6 12	6 14	6 15	6 16	6 17	6 18	6 18	6 19	6 20
16	6 06	6 07	6 09	6 10	6 11	6 12	6 13	6 14	6 15	6 15	6 16	6 16	6 17
17	6 05	6 06	6 08	6 09	6 10	6 11	6 12	6 12	6 13	6 13	6 14	6 14	6 14
18	6 05	6 06	6 07	6 08	6 08	6 09	6 09	6 10	6 10	6 10	6 11	6 11	6 11
19	6 05	6 05	6 06	6 07	6 07	6 07	6 07	6 08	6 08	6 08	6 08	6 08	6 08
20	6 04	6 05	6 05	6 05	6 05	6 06	6 05	6 05	6 05	6 05	6 05	6 05	6 05
21	6 04	6 04	6 04	6 04	6 04	6 04	6 04	6 03	6 03	6 03	6 03	6 02	6 02
22	6 04	6 04	6 03	6 03	6 03	6 02	6 02	6 01	6 01	6 00	6 00	6 00	5 59
23	6 04	6 03	6 02	6 02	6 01	6 01	6 00	5 59	5 58	5 58	5 57	5 57	5 56
24	6 03	6 02	6 02	6 00	6 00	5 59	5 58	5 57	5 56	5 55	5 55	5 54	5 53
25	6 03	6 02	6 01	5 59	5 58	5 57	5 56	5 54	5 54	5 53	5 52	5 51	5 50
26	6 03	6 01	6 00	5 58	5 57	5 56	5 54	5 52	5 52	5 50	5 50	5 48	5 47
27	6 02	6 01	5 59	5 57	5 56	5 54	5 52	5 50	5 49	5 48	5 47	5 46	5 44
28	6 02	6 00	5 58	5 56	5 54	5 52	5 50	5 48	5 47	5 46	5 44	5 43	5 41
29	6 02	6 00	5 57	5 54	5 53	5 51	5 48	5 46	5 44	5 43	5 41	5 40	5 38
30	6 02	5 59	5 56	5 53	5 51	5 49	5 47	5 44	5 42	5 41	5 39	5 37	5 35
31	6 01	5 58	5 56	5 52	5 50	5 48	5 45	5 41	5 40	5 38	5 36	5 34	5 32
Apr. 1	6 01	5 58	5 55	5 51	5 48	5 46	5 43	5 39	5 38	5 36	5 34	5 31	5 29
2	6 01	5 57	5 54	5 50	5 47	5 44	5 41	5 37	5 35	5 33	5 31	5 28	5 26
3	6 00	5 57	5 53	5 48	5 46	5 43	5 39	5 35	5 33	5 31	5 28	5 26	5 23
4	6 00	5 56	5 52	5 47	5 44	5 41	5 37	5 33	5 31	5 28	5 26	5 23	5 20
5	6 00	5 56	5 51	5 46	5 43	5 40	5 35	5 30	5 28	5 26	5 23	5 20	5 17
6	5 59	5 55	5 50	5 45	5 42	5 38	5 34	5 28	5 26	5 23	5 20	5 17	5 14
7	5 59	5 54	5 50	5 44	5 40	5 36	5 32	5 26	5 24	5 21	5 18	5 14	5 10
8	5 59	5 54	5 49	5 42	5 39	5 35	5 30	5 24	5 22	5 18	5 15	5 12	5 07
9	5 58	5 53	5 48	5 41	5 38	5 33	5 28	5 22	5 19	5 16	5 13	5 09	5 04
10	5 58	5 53	5 47	5 41	5 36	5 32	5 26	5 20	5 17	5 14	5 10	5 06	5 02
11	5 58	5 52	5 46	5 39	5 35	5 30	5 24	5 18	5 15	5 11	5 08	5 03	4 59
12	5 58	5 52	5 45	5 38	5 34	5 29	5 23	5 16	5 12	5 09	5 05	5 01	4 56
13	5 57	5 51	5 45	5 37	5 32	5 27	5 21	5 14	5 10	5 07	5 02	4 58	4 53
14	5 57	5 51	5 44	5 36	5 31	5 26	5 19	5 12	5 08	5 04	5 00	4 55	4 50
15	5 57	5 50	5 43	5 34	5 30	5 24	5 17	5 10	5 06	5 02	4 57	4 52	4 47
16	5 57	5 50	5 42	5 33	5 28	5 22	5 16	5 08	5 04	5 00	4 55	4 50	4 44
17	5 56	5 49	5 41	5 32	5 27	5 21	5 14	5 05	5 01	4 57	4 52	4 47	4 41
18	5 56	5 49	5 41	5 31	5 26	5 20	5 12	5 03	4 59	4 55	4 50	4 44	4 38
19	5 56	5 48	5 40	5 30	5 24	5 18	5 10	5 01	4 57	4 52	4 47	4 42	4 35
20	5 56	5 48	5 39	5 29	5 23	5 16	5 09	4 59	4 55	4 50	4 45	4 39	4 32
21	5 55	5 47	5 38	5 28	5 22	5 15	5 07	4 57	4 53	4 48	4 42	4 36	4 29

BEGINNING OF MORNING TWILIGHT

Mar. 12	4 58	5 00	4 59	4 56	4 52	4 48	4 43	4 35	4 31	4 26	4 21	4 15	4 08
22	4 55	4 54	4 50	4 43	4 38	4 31	4 23	4 11	4 05	3 59	3 51	3 43	3 33
Apr. 1	4 52	4 48	4 41	4 30	4 23	4 13	4 01	3 46	3 38	3 29	3 18	3 06	2 51
11	4 49	4 42	4 31	4 17	4 07	3 55	3 39	3 19	3 08	2 56	2 42	2 24	2 01
21	4 45	4 35	4 22	4 04	3 51	3 36	3 17	2 50	2 36	2 20	1 59	1 30	0 40

SUNSET, 1935

647

LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), AND ENDING OF EVENING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Mar. 15	18 13	18 11	18 10	18 08	18 07	18 06	18 05	18 03	18 03	18 02	18 01	18 01	18 00
16	18 12	18 11	18 10	18 08	18 08	18 07	18 06	18 05	18 04	18 04	18 03	18 03	18 02
17	18 12	18 11	18 10	18 09	18 08	18 08	18 07	18 06	18 06	18 06	18 05	18 05	18 04
18	18 12	18 11	18 10	18 10	18 09	18 09	18 08	18 08	18 08	18 08	18 08	18 07	18 07
19	18 12	18 11	18 11	18 10	18 10	18 10	18 10	18 10	18 10	18 10	18 10	18 10	18 09
20	18 11	18 11	18 11	18 11	18 11	18 11	18 11	18 11	18 11	18 12	18 12	18 12	18 12
21	18 11	18 11	18 11	18 11	18 12	18 12	18 12	18 13	18 13	18 13	18 14	18 14	18 14
22	18 10	18 11	18 11	18 12	18 12	18 13	18 14	18 14	18 15	18 15	18 16	18 16	18 17
23	18 10	18 11	18 12	18 13	18 13	18 14	18 15	18 16	18 16	18 17	18 18	18 18	18 19
24	18 10	18 11	18 12	18 13	18 14	18 15	18 16	18 18	18 18	18 19	18 20	18 21	18 22
25	18 10	18 11	18 12	18 14	18 15	18 16	18 17	18 19	18 20	18 21	18 22	18 23	18 24
26	18 09	18 11	18 12	18 14	18 16	18 17	18 19	18 21	18 22	18 23	18 24	18 25	18 26
27	18 09	18 11	18 13	18 15	18 16	18 18	18 20	18 22	18 23	18 25	18 26	18 27	18 29
28	18 09	18 11	18 13	18 16	18 17	18 19	18 21	18 24	18 25	18 26	18 28	18 30	18 31
29	18 08	18 11	18 13	18 16	18 18	18 20	18 22	18 25	18 27	18 28	18 30	18 32	18 34
30	18 08	18 11	18 14	18 17	18 19	18 21	18 24	18 27	18 28	18 30	18 32	18 34	18 36
31	18 08	18 11	18 14	18 18	18 20	18 22	18 25	18 28	18 30	18 32	18 34	18 36	18 39
Apr. 1	18 08	18 11	18 14	18 18	18 20	18 23	18 26	18 30	18 32	18 34	18 36	18 38	18 41
2	18 07	18 10	18 14	18 19	18 21	18 24	18 28	18 32	18 34	18 36	18 38	18 41	18 44
3	18 07	18 10	18 15	18 19	18 22	18 25	18 29	18 33	18 35	18 38	18 40	18 43	18 46
4	18 07	18 10	18 15	18 20	18 23	18 26	18 30	18 35	18 37	18 40	18 42	18 45	18 48
5	18 06	18 10	18 15	18 20	18 24	18 27	18 31	18 36	18 39	18 41	18 44	18 47	18 51
6	18 06	18 10	18 15	18 21	18 24	18 28	18 33	18 38	18 40	18 43	18 46	18 50	18 53
7	18 06	18 10	18 16	18 22	18 25	18 29	18 34	18 39	18 42	18 45	18 48	18 52	18 56
8	18 06	18 10	18 16	18 22	18 26	18 30	18 35	18 41	18 44	18 47	18 50	18 54	18 58
9	18 05	18 10	18 16	18 23	18 27	18 31	18 36	18 43	18 46	18 49	18 52	18 56	19 01
10	18 05	18 10	18 16	18 24	18 28	18 32	18 38	18 44	18 47	18 50	18 54	18 58	19 03
11	18 05	18 10	18 17	18 24	18 28	18 33	18 39	18 46	18 49	18 52	18 56	19 01	19 06
12	18 04	18 10	18 17	18 25	18 29	18 34	18 40	18 47	18 51	18 54	18 58	19 03	19 08
13	18 04	18 10	18 17	18 25	18 30	18 35	18 42	18 49	18 52	18 56	19 00	19 05	19 10
14	18 04	18 10	18 18	18 26	18 31	18 36	18 43	18 50	18 54	18 58	19 02	19 07	19 13
15	18 04	18 10	18 18	18 26	18 32	18 37	18 44	18 52	18 56	19 00	19 04	19 09	19 15
16	18 03	18 10	18 18	18 27	18 32	18 38	18 45	18 54	18 58	19 02	19 06	19 12	19 18
17	18 03	18 10	18 18	18 28	18 33	18 39	18 46	18 55	18 59	19 04	19 08	19 14	19 20
18	18 03	18 10	18 19	18 28	18 34	18 40	18 48	18 57	19 01	19 05	19 10	19 16	19 23
19	18 03	18 11	18 19	18 29	18 35	18 41	18 49	18 58	19 03	19 07	19 12	19 18	19 25
20	18 02	18 11	18 19	18 30	18 36	18 42	18 50	19 00	19 04	19 09	19 14	19 21	19 28
21	18 02	18 11	18 20	18 30	18 36	18 43	18 52	19 01	19 06	19 11	19 17	19 23	19 30

ENDING OF EVENING TWILIGHT

	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Mar. 12	19 22	19 21	19 22	19 26	19 29	19 33	19 39	19 47	19 51	19 56	20 01	20 08	20 15
22	19 19	19 21	19 25	19 32	19 38	19 45	19 54	20 06	20 11	20 18	20 26	20 35	20 46
Apr. 1	19 16	19 21	19 28	19 39	19 47	19 57	20 09	20 25	20 33	20 42	20 53	21 06	21 21
11	19 14	19 21	19 32	19 47	19 57	20 09	20 25	20 46	20 57	21 10	21 25	21 43	22 07
21	19 12	19 23	19 36	19 55	20 07	20 23	20 43	21 10	21 25	21 42	22 04	22 34	23 37

SUNRISE, 1935

LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), AND BEGINNING OF MORNING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Apr. 21	5 55	5 47	5 38	5 28	5 22	5 15	5 07	4 57	4 53	4 48	4 42	4 36	4 29
22	5 55	5 47	5 38	5 27	5 21	5 14	5 05	4 55	4 51	4 46	4 40	4 34	4 26
23	5 55	5 46	5 37	5 26	5 20	5 12	5 04	4 53	4 49	4 43	4 37	4 31	4 23
24	5 55	5 46	5 36	5 25	5 18	5 11	5 02	4 51	4 46	4 41	4 35	4 28	4 20
25	5 55	5 45	5 35	5 24	5 17	5 10	5 00	4 50	4 44	4 39	4 33	4 26	4 18
26	5 54	5 45	5 35	5 23	5 16	5 08	4 59	4 48	4 42	4 37	4 30	4 23	4 15
27	5 54	5 45	5 34	5 22	5 15	5 07	4 57	4 46	4 40	4 34	4 28	4 20	4 12
28	5 54	5 44	5 33	5 21	5 14	5 05	4 56	4 44	4 38	4 32	4 25	4 18	4 09
29	5 54	5 44	5 33	5 20	5 13	5 04	4 54	4 42	4 36	4 30	4 23	4 15	4 06
30	5 54	5 43	5 32	5 19	5 11	5 03	4 52	4 40	4 34	4 28	4 21	4 13	4 04
May 1	5 54	5 43	5 32	5 18	5 10	5 02	4 51	4 38	4 32	4 26	4 18	4 10	4 01
2	5 54	5 43	5 31	5 17	5 09	5 00	4 50	4 37	4 30	4 24	4 16	4 08	3 58
3	5 54	5 42	5 30	5 16	5 08	4 59	4 48	4 35	4 29	4 22	4 14	4 05	3 55
4	5 53	5 42	5 30	5 16	5 07	4 58	4 46	4 33	4 27	4 20	4 12	4 03	3 53
5	5 53	5 42	5 29	5 15	5 06	4 57	4 45	4 31	4 25	4 18	4 10	4 00	3 50
6	5 53	5 41	5 28	5 14	5 05	4 55	4 44	4 30	4 23	4 16	4 07	3 58	3 47
7	5 53	5 41	5 28	5 13	5 04	4 54	4 42	4 28	4 21	4 14	4 05	3 56	3 45
8	5 53	5 41	5 28	5 12	5 03	4 53	4 41	4 26	4 19	4 12	4 03	3 53	3 42
9	5 53	5 40	5 27	5 11	5 02	4 52	4 40	4 25	4 18	4 10	4 01	3 51	3 40
10	5 53	5 40	5 26	5 11	5 01	4 51	4 38	4 23	4 16	4 08	3 59	3 49	3 37
11	5 53	5 40	5 26	5 10	5 00	4 50	4 37	4 22	4 14	4 06	3 57	3 46	3 34
12	5 53	5 40	5 26	5 09	5 00	4 49	4 36	4 20	4 12	4 04	3 55	3 44	3 32
13	5 53	5 40	5 26	5 09	4 59	4 48	4 34	4 18	4 11	4 02	3 53	3 42	3 29
14	5 53	5 39	5 25	5 08	4 58	4 47	4 33	4 17	4 09	4 01	3 51	3 40	3 27
15	5 53	5 39	5 24	5 07	4 57	4 46	4 32	4 16	4 08	3 59	3 49	3 38	3 25
16	5 53	5 39	5 24	5 07	4 56	4 45	4 31	4 14	4 06	3 57	3 47	3 36	3 22
17	5 53	5 39	5 24	5 06	4 56	4 44	4 30	4 13	4 05	3 56	3 45	3 34	3 20
18	5 53	5 38	5 23	5 05	4 55	4 43	4 29	4 11	4 03	3 54	3 44	3 32	3 18
19	5 53	5 38	5 23	5 05	4 54	4 42	4 28	4 10	4 02	3 52	3 42	3 30	3 16
20	5 53	5 38	5 22	5 04	4 54	4 41	4 27	4 09	4 00	3 51	3 40	3 28	3 13
21	5 53	5 38	5 22	5 04	4 53	4 40	4 26	4 08	3 59	3 49	3 38	3 26	3 11
22	5 53	5 38	5 22	5 03	4 52	4 40	4 25	4 06	3 58	3 48	3 37	3 24	3 09
23	5 53	5 38	5 22	5 03	4 52	4 39	4 24	4 05	3 56	3 46	3 35	3 22	3 07
24	5 53	5 38	5 21	5 02	4 51	4 38	4 23	4 04	3 55	3 45	3 34	3 20	3 05
25	5 53	5 38	5 21	5 02	4 50	4 38	4 22	4 03	3 54	3 44	3 32	3 19	3 03
26	5 53	5 38	5 21	5 01	4 50	4 37	4 21	4 02	3 53	3 42	3 31	3 17	3 01
27	5 53	5 38	5 21	5 01	4 50	4 36	4 20	4 01	3 52	3 41	3 29	3 15	2 59
28	5 53	5 38	5 20	5 01	4 49	4 36	4 20	4 00	3 51	3 40	3 28	3 14	2 57

BEGINNING OF MORNING TWILIGHT

Apr. 21	4 45	4 35	4 22	4 04	3 51	3 36	3 17	2 50	2 36	2 20	1 59	1 30	0 40
May 1	4 43	4 30	4 14	3 51	3 37	3 18	2 54	2 20	2 01	1 36	1 00		
11	4 41	4 26	4 07	3 41	3 23	3 02	2 33	1 48	1 20	0 30			
21	4 40	4 23	4 01	3 32	3 12	2 47	2 13	1 13	0 02				
31	4 40	4 21	3 57	3 26	3 04	2 36	1 56	0 23					

Twilight lasts all night at latitude +60°, Apr. 23-Aug. 22; +58°, Apr. 29-Aug. 16; +56°, May 6-Aug. 9; +54°, May 13-Aug. 2; +52°, May 22-July 24; +50°, June 2-July 12.

SUNSET, 1935

649

LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB) AND ENDING OF EVENING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Apr. 21	h m 18 02	h m 18 11	h m 18 20	h m 18 30	h m 18 36	h m 18 43	h m 18 52	h m 19 01	h m 19 06	h m 19 11	h m 19 17	h m 19 23	h m 19 30
22	18 02	18 11	18 20	18 31	18 37	18 44	18 53	19 03	19 08	19 13	19 19	19 25	19 33
23	18 02	18 11	18 20	18 31	18 38	18 45	18 54	19 04	19 09	19 15	19 21	19 27	19 35
24	18 02	18 11	18 21	18 32	18 39	18 46	18 55	19 06	19 11	19 17	19 23	19 30	19 38
25	18 02	18 11	18 21	18 33	18 40	18 47	18 57	19 08	19 13	19 18	19 25	19 32	19 40
26	18 01	18 11	18 21	18 33	18 40	18 48	18 58	19 09	19 14	19 20	19 27	19 34	19 42
27	18 01	18 11	18 22	18 34	18 41	18 49	18 59	19 11	19 16	19 22	19 29	19 36	19 45
28	18 01	18 11	18 22	18 35	18 42	18 50	19 00	19 12	19 18	19 24	19 31	19 39	19 47
29	18 01	18 11	18 22	18 35	18 43	18 51	19 02	19 14	19 19	19 26	19 33	19 41	19 50
30	18 01	18 11	18 23	18 36	18 44	18 52	19 03	19 15	19 21	19 28	19 35	19 43	19 52
May 1	18 01	18 12	18 23	18 37	18 44	18 53	19 04	19 17	19 23	19 30	19 37	19 45	19 55
2	18 00	18 12	18 23	18 37	18 45	18 54	19 05	19 18	19 24	19 31	19 39	19 48	19 57
3	18 00	18 12	18 24	18 38	18 46	18 55	19 07	19 20	19 26	19 33	19 41	19 50	20 00
4	18 00	18 12	18 24	18 38	18 47	18 56	19 08	19 21	19 28	19 35	19 43	19 52	20 02
5	18 00	18 12	18 25	18 39	18 48	18 57	19 09	19 23	19 30	19 37	19 45	19 54	20 05
6	18 00	18 12	18 25	18 40	18 49	18 58	19 10	19 24	19 31	19 39	19 47	19 56	20 07
7	18 00	18 12	18 25	18 40	18 49	18 59	19 12	19 26	19 33	19 40	19 49	19 58	20 10
8	18 00	18 12	18 26	18 41	18 50	19 00	19 13	19 28	19 34	19 42	19 51	20 01	20 12
9	18 00	18 12	18 26	18 42	18 51	19 01	19 14	19 29	19 36	19 44	19 53	20 03	20 15
10	18 00	18 13	18 26	18 42	18 52	19 02	19 15	19 30	19 38	19 46	19 55	20 05	20 17
11	18 00	18 13	18 27	18 43	18 53	19 03	19 16	19 32	19 39	19 48	19 57	20 07	20 20
12	18 00	18 13	18 27	18 44	18 53	19 04	19 17	19 33	19 41	19 49	19 59	20 09	20 22
13	18 00	18 13	18 28	18 44	18 54	19 05	19 19	19 35	19 42	19 51	20 01	20 12	20 24
14	18 00	18 13	18 28	18 45	18 55	19 06	19 20	19 36	19 44	19 53	20 02	20 14	20 27
15	18 00	18 14	18 28	18 46	18 56	19 07	19 21	19 38	19 46	19 54	20 04	20 16	20 29
16	18 00	18 14	18 29	18 46	18 56	19 08	19 22	19 39	19 47	19 56	20 06	20 18	20 31
17	18 00	18 14	18 29	18 47	18 57	19 09	19 23	19 40	19 49	19 58	20 08	20 20	20 34
18	18 00	18 14	18 30	18 48	18 58	19 10	19 24	19 42	19 50	19 59	20 10	20 22	20 36
19	18 00	18 14	18 30	18 48	18 59	19 11	19 25	19 43	19 52	20 01	20 12	20 24	20 38
20	18 00	18 15	18 30	18 49	19 00	19 12	19 26	19 44	19 53	20 03	20 14	20 26	20 40
21	18 00	18 15	18 31	18 49	19 00	19 13	19 28	19 46	19 55	20 04	20 15	20 28	20 43
22	18 00	18 15	18 31	18 50	19 01	19 14	19 29	19 47	19 56	20 06	20 17	20 30	20 45
23	18 00	18 15	18 32	18 51	19 02	19 15	19 30	19 48	19 57	20 07	20 19	20 32	20 47
24	18 00	18 16	18 32	18 51	19 02	19 15	19 31	19 50	19 59	20 09	20 20	20 34	20 49
25	18 00	18 16	18 32	18 52	19 03	19 16	19 32	19 51	20 00	20 10	20 22	20 36	20 52
26	18 00	18 16	18 33	18 52	19 04	19 17	19 33	19 52	20 02	20 12	20 24	20 37	20 54
27	18 00	18 16	18 33	18 53	19 05	19 18	19 34	19 53	20 03	20 13	20 25	20 39	20 56
28	18 01	18 17	18 34	18 54	19 05	19 19	19 35	19 55	20 04	20 15	20 27	20 41	20 58

ENDING OF EVENING TWILIGHT

	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 21	19 12	19 23	19 36	19 55	20 07	20 23	20 43	21 10	21 25	21 42	22 04	22 34	23 37
May 1	19 12	19 25	19 41	20 04	20 19	20 37	21 02	21 37	21 57	22 22	23 03		
11	19 12	19 27	19 47	20 13	20 30	20 52	21 22	22 08	22 37	23 37			
21	19 13	19 31	19 52	20 22	20 41	21 07	21 42	22 44					
31	19 15	19 34	19 58	20 30	20 51	21 20	22 01	23 42					

Twilight lasts all night at latitude +60°, Apr. 23-Aug. 22; +58°, Apr. 29-Aug. 16; +56°, May 6-Aug. 9; +54°, May 13-Aug. 2; +52°, May 22-July 24; +50°, June 2-July 12.

LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), AND BEGINNING OF MORNING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
May 28	5 53	5 38	5 20	5 01	4 49	4 36	4 20	4 00	3 51	3 40	3 28	3 14	2 57
29	5 54	5 38	5 20	5 00	4 49	4 35	4 19	3 59	3 50	3 39	3 27	3 12	2 56
30	5 54	5 38	5 20	5 00	4 48	4 35	4 18	3 58	3 49	3 38	3 25	3 11	2 54
31	5 54	5 38	5 20	5 00	4 48	4 34	4 18	3 57	3 48	3 37	3 24	3 10	2 52
June 1	5 54	5 38	5 20	4 59	4 47	4 34	4 17	3 56	3 47	3 36	3 23	3 08	2 50
2	5 54	5 38	5 20	4 59	4 47	4 33	4 16	3 56	3 46	3 35	3 22	3 07	2 49
3	5 54	5 38	5 20	4 59	4 47	4 33	4 16	3 55	3 45	3 34	3 21	3 06	2 48
4	5 54	5 38	5 20	4 59	4 46	4 32	4 16	3 54	3 44	3 33	3 20	3 05	2 46
5	5 54	5 38	5 20	4 59	4 46	4 32	4 15	3 54	3 44	3 32	3 19	3 04	2 45
6	5 55	5 38	5 20	4 58	4 46	4 32	4 15	3 53	3 43	3 31	3 18	3 03	2 44
7	5 55	5 38	5 20	4 58	4 46	4 31	4 14	3 53	3 42	3 31	3 17	3 02	2 43
8	5 55	5 38	5 20	4 58	4 46	4 31	4 14	3 52	3 42	3 30	3 16	3 01	2 42
9	5 55	5 38	5 20	4 58	4 46	4 31	4 14	3 52	3 41	3 30	3 16	3 00	2 41
10	5 55	5 38	5 20	4 58	4 45	4 31	4 13	3 51	3 41	3 29	3 15	2 59	2 40
11	5 56	5 38	5 20	4 58	4 45	4 31	4 13	3 51	3 40	3 28	3 15	2 58	2 39
12	5 56	5 38	5 20	4 58	4 45	4 30	4 13	3 51	3 40	3 28	3 14	2 58	2 38
13	5 56	5 39	5 20	4 58	4 45	4 30	4 13	3 50	3 40	3 28	3 14	2 57	2 37
14	5 56	5 39	5 20	4 58	4 45	4 30	4 12	3 50	3 40	3 27	3 13	2 57	2 37
15	5 56	5 39	5 20	4 58	4 45	4 30	4 12	3 50	3 39	3 27	3 13	2 56	2 36
16	5 56	5 39	5 20	4 58	4 45	4 30	4 12	3 50	3 39	3 27	3 13	2 56	2 36
17	5 57	5 39	5 20	4 58	4 45	4 30	4 12	3 50	3 39	3 27	3 13	2 56	2 36
18	5 57	5 40	5 20	4 59	4 45	4 30	4 12	3 50	3 39	3 27	3 12	2 56	2 35
19	5 57	5 40	5 21	4 59	4 46	4 30	4 13	3 50	3 39	3 27	3 12	2 56	2 35
20	5 57	5 40	5 21	4 59	4 46	4 31	4 13	3 50	3 39	3 27	3 12	2 56	2 35
21	5 58	5 40	5 21	4 59	4 46	4 31	4 13	3 50	3 39	3 27	3 13	2 56	2 35
22	5 58	5 40	5 21	4 59	4 46	4 31	4 13	3 50	3 39	3 27	3 13	2 56	2 35
23	5 58	5 40	5 22	4 59	4 46	4 31	4 13	3 51	3 40	3 27	3 13	2 56	2 36
24	5 58	5 41	5 22	5 00	4 46	4 31	4 13	3 51	3 40	3 28	3 13	2 56	2 36
25	5 58	5 41	5 22	5 00	4 47	4 32	4 14	3 51	3 40	3 28	3 14	2 57	2 36
26	5 59	5 41	5 22	5 00	4 47	4 32	4 14	3 52	3 41	3 28	3 14	2 57	2 37
27	5 59	5 41	5 22	5 00	4 48	4 32	4 14	3 52	3 41	3 29	3 15	2 58	2 38
28	5 59	5 42	5 23	5 01	4 48	4 33	4 15	3 52	3 42	3 29	3 15	2 58	2 38
29	5 59	5 42	5 23	5 01	4 48	4 33	4 15	3 53	3 42	3 30	3 16	2 59	2 39
30	6 00	5 42	5 23	5 01	4 48	4 34	4 16	3 53	3 43	3 30	3 16	3 00	2 40
July 1	6 00	5 42	5 24	5 02	4 49	4 34	4 16	3 54	3 43	3 31	3 17	3 01	2 41
2	6 00	5 43	5 24	5 02	4 49	4 34	4 17	3 55	3 44	3 32	3 18	3 02	2 42
3	6 00	5 43	5 24	5 02	4 50	4 35	4 17	3 55	3 45	3 33	3 19	3 03	2 43

BEGINNING OF MORNING TWILIGHT

May 21	4 40	4 23	4 01	3 32	3 12	2 47	2 13	1 13	0 02				
31	4 40	4 21	3 57	3 26	3 04	2 36	1 56	0 23					
June 10	4 41	4 21	3 56	3 22	2 59	2 29	1 43						
20	4 42	4 22	3 57	3 22	2 59	2 27	1 39						
30	4 45	4 25	3 59	3 25	3 02	2 31	1 44						
July 10	4 47	4 28	4 04	3 31	3 09	2 39	1 56						

Twilight lasts all night at latitude +60°, Apr. 23-Aug. 22; +58°, Apr. 29-Aug. 16; +56°, May 6-Aug. 9; +54°, May 13-Aug. 2; +52°, May 22-July 24; +50°, June 2-July 12.

SUNSET, 1935

651

LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), AND ENDING OF EVENING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
May	28	18 01	18 17	18 34	18 54	19 05	19 19	19 35	19 55	20 04	20 15	20 27	20 41	20 58
	29	18 01	18 17	18 34	18 54	19 06	19 20	19 36	19 56	20 05	20 16	20 28	20 43	21 00
	30	18 01	18 17	18 34	18 55	19 07	19 20	19 36	19 57	20 06	20 17	20 30	20 44	21 02
	31	18 01	18 17	18 35	18 55	19 07	19 21	19 37	19 58	20 07	20 19	20 31	20 46	21 04
June	1	18 01	18 18	18 35	18 56	19 08	19 22	19 38	19 59	20 08	20 20	20 33	20 48	21 05
	2	18 01	18 18	18 36	18 56	19 08	19 22	19 39	20 00	20 10	20 21	20 34	20 49	21 07
	3	18 01	18 18	18 36	18 56	19 09	19 23	19 40	20 01	20 11	20 22	20 35	20 50	21 09
	4	18 02	18 18	18 36	18 57	19 10	19 24	19 41	20 02	20 12	20 24	20 37	20 52	21 10
	5	18 02	18 18	18 37	18 58	19 10	19 24	19 42	20 03	20 13	20 25	20 38	20 53	21 12
	6	18 02	18 19	18 37	18 58	19 11	19 25	19 42	20 04	20 14	20 26	20 39	20 55	21 14
	7	18 02	18 19	18 38	18 59	19 11	19 26	19 43	20 05	20 15	20 27	20 40	20 56	21 15
	8	18 02	18 20	18 38	18 59	19 12	19 26	19 44	20 06	20 16	20 28	20 41	20 57	21 16
	9	18 02	18 20	18 38	19 00	19 12	19 27	19 44	20 06	20 17	20 29	20 42	20 58	21 18
	10	18 03	18 20	18 38	19 00	19 13	19 28	19 45	20 07	20 18	20 30	20 43	20 59	21 19
	11	18 03	18 20	18 39	19 01	19 13	19 28	19 46	20 08	20 18	20 30	20 44	21 01	21 20
	12	18 03	18 20	18 39	19 01	19 14	19 29	19 46	20 08	20 19	20 31	20 45	21 02	21 21
	13	18 03	18 21	18 40	19 01	19 14	19 29	19 47	20 09	20 20	20 32	20 46	21 02	21 22
	14	18 04	18 21	18 40	19 02	19 15	19 30	19 47	20 10	20 20	20 33	20 47	21 03	21 23
	15	18 04	18 21	18 40	19 02	19 15	19 30	19 48	20 10	20 21	20 33	20 47	21 04	21 24
	16	18 04	18 22	18 40	19 02	19 15	19 30	19 48	20 11	20 22	20 34	20 48	21 05	21 25
	17	18 04	18 22	18 41	19 03	19 16	19 31	19 49	20 11	20 22	20 34	20 49	21 05	21 26
	18	18 04	18 22	18 41	19 03	19 16	19 31	19 49	20 12	20 22	20 35	20 49	21 06	21 26
	19	18 05	18 22	18 41	19 03	19 16	19 31	19 49	20 12	20 23	20 35	20 50	21 06	21 27
	20	18 05	18 22	18 41	19 04	19 17	19 32	19 50	20 12	20 23	20 36	20 50	21 07	21 27
	21	18 05	18 23	18 42	19 04	19 17	19 32	19 50	20 12	20 24	20 36	20 50	21 07	21 28
	22	18 05	18 23	18 42	19 04	19 17	19 32	19 50	20 13	20 24	20 36	20 50	21 07	21 28
	23	18 05	18 23	18 42	19 04	19 17	19 32	19 50	20 13	20 24	20 36	20 50	21 07	21 28
	24	18 06	18 23	18 42	19 04	19 17	19 32	19 50	20 13	20 24	20 36	20 51	21 07	21 28
	25	18 06	18 24	18 42	19 04	19 18	19 32	19 50	20 13	20 24	20 36	20 51	21 07	21 28
	26	18 06	18 24	18 43	19 05	19 18	19 33	19 51	20 13	20 24	20 36	20 51	21 07	21 28
	27	18 06	18 24	18 43	19 05	19 18	19 33	19 51	20 13	20 24	20 36	20 50	21 07	21 28
	28	18 06	18 24	18 43	19 05	19 18	19 33	19 51	20 13	20 24	20 36	20 50	21 07	21 27
	29	18 07	18 24	18 43	19 05	19 18	19 33	19 50	20 13	20 24	20 36	20 50	21 07	21 27
	30	18 07	18 24	18 43	19 05	19 18	19 33	19 50	20 13	20 24	20 36	20 50	21 07	21 26
July	1	18 07	18 24	18 43	19 05	19 18	19 33	19 50	20 13	20 23	20 35	20 49	21 06	21 26
	2	18 07	18 25	18 43	19 05	19 18	19 33	19 50	20 12	20 23	20 35	20 49	21 05	21 25
	3	18 08	18 25	18 43	19 05	19 18	19 32	19 50	20 12	20 23	20 35	20 48	21 05	21 24

ENDING OF EVENING TWILIGHT

May	21	19 13	19 31	19 52	20 22	20 41	21 07	21 42	22 44					
	31	19 15	19 34	19 58	20 30	20 51	21 20	22 01	23 42					
June	10	19 18	19 37	20 02	20 36	20 59	21 30	22 16						
	20	19 20	19 40	20 06	20 40	21 04	21 35	22 23						
	30	19 22	19 42	20 07	20 41	21 04	21 35	22 22						
July	10	19 23	19 42	20 06	20 39	21 01	21 30	22 13						

Twilight lasts all night at latitude +60°, Apr. 23-Aug. 22; +58°, Apr. 29-Aug. 16; +56°, May 6-Aug. 9; +54°, May 13-Aug. 2; +52°, May 22-July 24; +50°, June 2-July 12.

SUNRISE, 1935

LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), AND BEGINNING OF MORNING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
July 3	6 00	5 43	5 24	5 02	4 50	4 35	4 17	3 55	3 45	3 33	3 19	3 03	2 43
4	6 00	5 43	5 25	5 03	4 50	4 36	4 18	3 56	3 45	3 34	3 20	3 04	2 44
5	6 00	5 43	5 25	5 03	4 51	4 36	4 19	3 57	3 46	3 34	3 21	3 05	2 45
6	6 01	5 44	5 25	5 04	4 51	4 37	4 19	3 58	3 47	3 35	3 22	3 06	2 46
7	6 01	5 44	5 26	5 04	4 52	4 37	4 20	3 58	3 48	3 36	3 23	3 07	2 48
8	6 01	5 44	5 26	5 05	4 52	4 38	4 21	3 59	3 49	3 37	3 24	3 08	2 49
9	6 01	5 44	5 26	5 05	4 53	4 38	4 21	4 00	3 50	3 38	3 25	3 10	2 51
10	6 01	5 45	5 27	5 06	4 53	4 39	4 22	4 01	3 51	3 39	3 26	3 11	2 52
11	6 02	5 45	5 27	5 06	4 54	4 40	4 23	4 02	3 52	3 40	3 27	3 12	2 54
12	6 02	5 45	5 27	5 07	4 54	4 40	4 24	4 03	3 53	3 42	3 29	3 14	2 56
13	6 02	5 45	5 28	5 07	4 55	4 41	4 24	4 04	3 54	3 43	3 30	3 15	2 57
14	6 02	5 46	5 28	5 08	4 56	4 42	4 25	4 05	3 55	3 44	3 32	3 17	2 59
15	6 02	5 46	5 28	5 08	4 56	4 43	4 26	4 06	3 56	3 45	3 33	3 18	3 01
16	6 02	5 46	5 29	5 09	4 57	4 43	4 27	4 07	3 58	3 47	3 34	3 20	3 03
17	6 02	5 46	5 29	5 09	4 58	4 44	4 28	4 08	3 59	3 48	3 36	3 22	3 05
18	6 02	5 47	5 30	5 10	4 58	4 45	4 29	4 09	4 00	3 49	3 37	3 24	3 07
19	6 02	5 47	5 30	5 10	4 59	4 46	4 30	4 10	4 01	3 51	3 39	3 25	3 09
20	6 02	5 47	5 30	5 11	5 00	4 46	4 31	4 12	4 02	3 52	3 41	3 27	3 11
21	6 03	5 47	5 31	5 12	5 00	4 47	4 32	4 13	4 04	3 54	3 42	3 29	3 13
22	6 03	5 48	5 31	5 12	5 01	4 48	4 33	4 14	4 05	3 55	3 44	3 31	3 15
23	6 03	5 48	5 32	5 13	5 02	4 49	4 34	4 15	4 07	3 57	3 45	3 33	3 17
24	6 03	5 48	5 32	5 13	5 02	4 50	4 35	4 17	4 08	3 58	3 47	3 34	3 20
25	6 03	5 48	5 32	5 14	5 03	4 51	4 36	4 18	4 09	4 00	3 49	3 36	3 22
26	6 03	5 48	5 33	5 14	5 04	4 52	4 37	4 19	4 11	4 01	3 51	3 38	3 24
27	6 03	5 48	5 33	5 15	5 05	4 52	4 38	4 20	4 12	4 03	3 52	3 40	3 26
28	6 03	5 49	5 33	5 16	5 05	4 53	4 39	4 22	4 14	4 05	3 54	3 42	3 28
29	6 03	5 49	5 34	5 16	5 06	4 54	4 40	4 23	4 15	4 06	3 56	3 44	3 31
30	6 03	5 49	5 34	5 17	5 07	4 55	4 42	4 25	4 17	4 08	3 58	3 46	3 33
31	6 03	5 49	5 34	5 18	5 08	4 56	4 43	4 26	4 18	4 10	4 00	3 48	3 35
Aug. 1	6 03	5 49	5 35	5 18	5 08	4 57	4 44	4 27	4 20	4 11	4 01	3 51	3 38
2	6 03	5 50	5 35	5 19	5 09	4 58	4 45	4 29	4 21	4 13	4 03	3 53	3 40
3	6 03	5 50	5 36	5 19	5 10	4 59	4 46	4 30	4 23	4 15	4 05	3 55	3 42
4	6 03	5 50	5 36	5 20	5 10	5 00	4 47	4 32	4 24	4 16	4 07	3 57	3 45
5	6 02	5 50	5 36	5 20	5 11	5 01	4 48	4 33	4 26	4 18	4 09	3 59	3 47
6	6 02	5 50	5 36	5 21	5 12	5 02	4 50	4 34	4 28	4 20	4 11	4 01	3 50
7	6 02	5 50	5 37	5 22	5 13	5 03	4 51	4 36	4 29	4 21	4 13	4 03	3 52
8	6 02	5 50	5 37	5 22	5 14	5 04	4 52	4 37	4 31	4 23	4 15	4 05	3 54
9	6 02	5 50	5 38	5 23	5 14	5 05	4 53	4 39	4 32	4 25	4 17	4 08	3 57

BEGINNING OF MORNING TWILIGHT

June 30	4 45	4 25	3 59	3 25	3 02	2 31	1 44						
July 10	4 47	4 28	4 04	3 31	3 09	2 39	1 56						
20	4 49	4 31	4 09	3 38	3 18	2 51	2 14	1 04					
30	4 50	4 34	4 14	3 46	3 28	3 05	2 33	1 43	1 07				
Aug. 9	4 50	4 36	4 19	3 55	3 39	3 20	2 52	2 15	1 53	1 20			

Twilight lasts all night at latitude +60°, Apr. 23-Aug. 22; +58°, Apr. 29-Aug. 16; +56°, May 6-Aug. 9; +54°, May 13-Aug. 2; +52°, May 22-July 24; +50°, June 2-July 12.

SUNSET, 1935

653

LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), AND ENDING OF EVENING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
July	3	18 08	18 25	18 43	19 05	19 18	19 32	19 50	20 12	20 23	20 35	20 48	21 05	21 24
	4	18 08	18 25	18 43	19 05	19 18	19 32	19 50	20 12	20 22	20 34	20 48	21 04	21 24
	5	18 08	18 25	18 43	19 05	19 18	19 32	19 50	20 11	20 22	20 34	20 47	21 03	21 23
	6	18 08	18 25	18 43	19 05	19 17	19 32	19 49	20 11	20 21	20 33	20 47	21 02	21 22
	7	18 08	18 25	18 43	19 05	19 17	19 32	19 49	20 10	20 21	20 32	20 46	21 01	21 20
	8	18 08	18 25	18 43	19 04	19 17	19 31	19 48	20 10	20 20	20 32	20 45	21 00	21 19
	9	18 08	18 25	18 43	19 04	19 17	19 31	19 48	20 09	20 19	20 31	20 44	20 59	21 18
	10	18 09	18 25	18 43	19 04	19 16	19 31	19 48	20 09	20 19	20 30	20 43	20 58	21 17
	11	18 09	18 25	18 43	19 04	19 16	19 30	19 47	20 08	20 18	20 29	20 42	20 57	21 16
	12	18 09	18 25	18 43	19 04	19 16	19 30	19 46	20 07	20 17	20 28	20 41	20 56	21 14
	13	18 09	18 25	18 43	19 03	19 16	19 29	19 46	20 06	20 16	20 27	20 40	20 55	21 12
	14	18 09	18 25	18 43	19 03	19 15	19 29	19 45	20 06	20 15	20 26	20 39	20 53	21 11
	15	18 09	18 25	18 43	19 03	19 15	19 28	19 45	20 05	20 14	20 25	20 38	20 52	21 09
	16	18 09	18 25	18 42	19 02	19 14	19 28	19 44	20 04	20 13	20 24	20 36	20 51	21 08
	17	18 09	18 25	18 42	19 02	19 14	19 27	19 43	20 03	20 12	20 23	20 35	20 49	21 06
	18	18 09	18 25	18 42	19 02	19 13	19 27	19 42	20 02	20 11	20 22	20 34	20 47	21 04
	19	18 10	18 25	18 42	19 01	19 13	19 26	19 42	20 01	20 10	20 20	20 32	20 46	21 02
	20	18 10	18 25	18 42	19 01	19 12	19 25	19 41	20 00	20 09	20 19	20 31	20 44	21 00
	21	18 10	18 25	18 41	19 00	19 12	19 25	19 40	19 59	20 08	20 18	20 29	20 42	20 58
	22	18 10	18 25	18 41	19 00	19 11	19 24	19 39	19 58	20 06	20 16	20 28	20 41	20 56
	23	18 10	18 25	18 41	18 59	19 10	19 23	19 38	19 56	20 05	20 15	20 26	20 39	20 54
	24	18 10	18 24	18 40	18 59	19 10	19 22	19 37	19 55	20 04	20 13	20 24	20 37	20 52
	25	18 10	18 24	18 40	18 58	19 09	19 21	19 36	19 54	20 02	20 12	20 23	20 35	20 50
	26	18 10	18 24	18 40	18 58	19 08	19 21	19 35	19 53	20 01	20 10	20 21	20 33	20 48
	27	18 10	18 24	18 39	18 57	19 08	19 20	19 34	19 51	20 00	20 09	20 19	20 31	20 45
	28	18 10	18 24	18 39	18 56	19 07	19 19	19 33	19 50	19 58	20 07	20 18	20 29	20 43
	29	18 10	18 24	18 39	18 56	19 06	19 18	19 32	19 49	19 56	20 05	20 16	20 27	20 40
	30	18 10	18 23	18 38	18 55	19 05	19 17	19 30	19 47	19 55	20 04	20 14	20 25	20 38
	31	18 10	18 23	18 38	18 55	19 04	19 16	19 29	19 46	19 54	20 02	20 12	20 23	20 36
Aug.	1	18 10	18 23	18 37	18 54	19 04	19 15	19 28	19 44	19 52	20 00	20 10	20 21	20 33
	2	18 09	18 23	18 37	18 53	19 03	19 14	19 27	19 43	19 50	19 58	20 08	20 18	20 31
	3	18 09	18 22	18 36	18 52	19 02	19 13	19 26	19 41	19 48	19 57	20 06	20 16	20 28
	4	18 09	18 22	18 36	18 52	19 01	19 12	19 24	19 40	19 47	19 55	20 04	20 14	20 26
	5	18 09	18 22	18 35	18 51	19 00	19 10	19 23	19 38	19 45	19 53	20 02	20 12	20 23
	6	18 09	18 22	18 35	18 50	18 59	19 09	19 21	19 36	19 43	19 51	20 00	20 09	20 21
	7	18 09	18 21	18 34	18 49	18 58	19 08	19 20	19 35	19 41	19 49	19 58	20 07	20 18
	8	18 09	18 21	18 34	18 48	18 57	19 07	19 19	19 33	19 40	19 47	19 55	20 05	20 15
	9	18 09	18 20	18 33	18 48	18 56	19 06	19 17	19 31	19 38	19 45	19 53	20 02	20 13

ENDING OF EVENING TWILIGHT

June 30	19 22	19 42	20 07	20 41	21 04	21 35	22 22							
July 10	19 23	19 42	20 06	20 39	21 01	21 30	22 13							
20	19 23	19 41	20 03	20 34	20 54	21 20	21 57	23 04						
30	19 22	19 38	19 58	20 25	20 43	21 06	21 38	22 26	23 00					
Aug. 9	19 20	19 34	19 51	20 15	20 30	20 50	21 16	21 53	22 15	22 45				

Twilight lasts all night at latitude +60°, Apr. 23-Aug. 22; +58°, Apr. 29-Aug. 16; +56°, May 6-Aug. 9; +54°, May 13-Aug. 2; +52°, May 22-July 24; +50°, June 2-July 12.

SUNRISE, 1935

LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), AND BEGINNING OF MORNING TWILIGHT, MERIDIAN OF GREENWICH, 1935

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Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Aug.	9	6 02	5 50	5 38	5 23	5 14	5 05	4 53	4 39	4 32	4 25	4 17	4 08	3 57
	10	6 02	5 50	5 38	5 24	5 15	5 06	4 54	4 40	4 34	4 27	4 19	4 10	3 59
	11	6 02	5 50	5 38	5 24	5 16	5 06	4 55	4 42	4 36	4 28	4 21	4 12	4 02
	12	6 02	5 51	5 38	5 25	5 17	5 07	4 57	4 43	4 37	4 30	4 23	4 14	4 04
	13	6 02	5 51	5 39	5 25	5 17	5 08	4 58	4 45	4 39	4 32	4 24	4 16	4 06
	14	6 01	5 51	5 39	5 26	5 18	5 09	4 59	4 47	4 40	4 34	4 26	4 18	4 09
	15	6 01	5 51	5 40	5 26	5 19	5 10	5 00	4 48	4 42	4 36	4 28	4 20	4 11
	16	6 01	5 51	5 40	5 27	5 20	5 11	5 01	4 49	4 44	4 37	4 30	4 22	4 14
	17	6 01	5 51	5 40	5 28	5 20	5 12	5 02	4 51	4 45	4 39	4 32	4 25	4 16
	18	6 01	5 51	5 40	5 28	5 21	5 13	5 04	4 52	4 47	4 41	4 34	4 27	4 18
	19	6 00	5 51	5 41	5 29	5 22	5 14	5 05	4 54	4 48	4 43	4 36	4 29	4 21
	20	6 00	5 51	5 41	5 29	5 23	5 15	5 06	4 55	4 50	4 44	4 38	4 31	4 23
	21	6 00	5 51	5 41	5 30	5 23	5 16	5 07	4 57	4 52	4 46	4 40	4 33	4 26
	22	6 00	5 51	5 42	5 31	5 24	5 17	5 08	4 58	4 53	4 48	4 42	4 36	4 28
	23	5 59	5 51	5 42	5 31	5 25	5 18	5 10	5 00	4 55	4 50	4 44	4 38	4 30
	24	5 59	5 51	5 42	5 32	5 26	5 19	5 11	5 01	4 57	4 52	4 46	4 40	4 33
	25	5 59	5 51	5 42	5 32	5 26	5 20	5 12	5 03	4 58	4 53	4 48	4 42	4 35
	26	5 59	5 51	5 42	5 33	5 27	5 21	5 13	5 04	5 00	4 55	4 50	4 44	4 38
	27	5 58	5 51	5 43	5 33	5 28	5 22	5 14	5 06	5 02	4 57	4 52	4 46	4 40
	28	5 58	5 51	5 43	5 34	5 29	5 23	5 16	5 07	5 03	4 59	4 54	4 48	4 42
	29	5 58	5 51	5 43	5 34	5 29	5 24	5 17	5 08	5 05	5 00	4 56	4 51	4 45
	30	5 58	5 51	5 44	5 35	5 30	5 24	5 18	5 10	5 06	5 02	4 58	4 53	4 47
	31	5 57	5 51	5 44	5 36	5 31	5 25	5 19	5 12	5 08	5 04	5 00	4 55	4 50
Sept.	1	5 57	5 51	5 44	5 36	5 32	5 26	5 20	5 13	5 10	5 06	5 02	4 57	4 52
	2	5 57	5 51	5 44	5 37	5 32	5 27	5 22	5 14	5 11	5 08	5 04	4 59	4 54
	3	5 56	5 51	5 44	5 37	5 33	5 28	5 23	5 16	5 13	5 09	5 06	5 01	4 57
	4	5 56	5 51	5 45	5 38	5 34	5 29	5 24	5 18	5 14	5 11	5 08	5 04	4 59
	5	5 56	5 50	5 45	5 38	5 34	5 30	5 25	5 19	5 16	5 13	5 10	5 06	5 02
	6	5 55	5 50	5 45	5 39	5 35	5 31	5 26	5 20	5 18	5 15	5 12	5 08	5 04
	7	5 55	5 50	5 45	5 40	5 36	5 32	5 28	5 22	5 19	5 17	5 14	5 10	5 06
	8	5 55	5 50	5 46	5 40	5 37	5 33	5 29	5 24	5 21	5 18	5 15	5 12	5 08
	9	5 54	5 50	5 46	5 41	5 38	5 34	5 30	5 25	5 23	5 20	5 17	5 14	5 11
	10	5 54	5 50	5 46	5 41	5 38	5 35	5 31	5 26	5 24	5 22	5 19	5 16	5 13
	11	5 54	5 50	5 46	5 42	5 39	5 36	5 32	5 28	5 26	5 24	5 21	5 19	5 16
	12	5 53	5 50	5 46	5 42	5 40	5 37	5 34	5 29	5 28	5 26	5 23	5 21	5 18
	13	5 53	5 50	5 47	5 43	5 40	5 38	5 35	5 31	5 29	5 27	5 25	5 23	5 20
	14	5 53	5 50	5 47	5 43	5 41	5 39	5 36	5 32	5 31	5 29	5 27	5 25	5 23
	15	5 52	5 50	5 47	5 44	5 42	5 40	5 37	5 34	5 32	5 31	5 29	5 27	5 25

BEGINNING OF MORNING TWILIGHT

Aug.	9	4 50	4 36	4 19	3 55	3 39	3 20	3 02	2 45	2 28	2 10	1 52	1 34	1 16
	19	4 50	4 39	4 24	4 04	3 50	3 34	3 12	2 42	2 26	2 07	1 40	1 16	0 56
	29	4 48	4 40	4 28	4 11	4 00	3 47	3 29	3 06	2 54	2 40	2 23	2 02	1 31
Sept.	8	4 46	4 40	4 31	4 19	4 10	3 59	3 46	3 28	3 19	3 08	2 56	2 41	2 23
	18	4 42	4 40	4 34	4 25	4 19	4 11	4 01	3 47	3 40	3 33	3 24	3 13	3 00

Twilight lasts all night at latitude +60°, Apr. 23-Aug. 22; +58°, Apr. 29-Aug. 16; +56°, May 6-Aug. 9; +54°, May 13-Aug. 2; +52°, May 22-July 24; +50°, June 2-July 12.

SUNSET, 1935

655

LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), AND ENDING OF EVENING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Aug. 9	h m 18 09	h m 18 20	h m 18 33	h m 18 48	h m 18 56	h m 19 06	h m 19 17	h m 19 31	h m 19 38	h m 19 45	h m 19 53	h m 20 02	h m 20 13
10	18 09	18 20	18 32	18 47	18 55	19 05	19 16	19 29	19 36	19 43	19 51	20 00	20 10
11	18 08	18 20	18 32	18 46	18 54	19 03	19 14	19 28	19 34	19 41	19 49	19 57	20 07
12	18 08	18 19	18 31	18 45	18 53	19 02	19 13	19 26	19 32	19 39	19 46	19 55	20 05
13	18 08	18 19	18 30	18 44	18 52	19 01	19 11	19 24	19 30	19 37	19 44	19 52	20 02
14	18 08	18 18	18 30	18 43	18 51	19 00	19 10	19 22	19 28	19 35	19 42	19 50	19 59
15	18 08	18 18	18 29	18 42	18 50	18 58	19 08	19 20	19 26	19 32	19 40	19 47	19 56
16	18 08	18 18	18 28	18 41	18 48	18 57	19 06	19 18	19 24	19 30	19 37	19 45	19 54
17	18 07	18 17	18 28	18 40	18 47	18 56	19 05	19 17	19 22	19 28	19 35	19 42	19 51
18	18 07	18 17	18 27	18 39	18 46	18 54	19 03	19 15	19 20	19 26	19 32	19 40	19 48
19	18 07	18 16	18 26	18 38	18 45	18 53	19 02	19 13	19 18	19 24	19 30	19 37	19 45
20	18 07	18 16	18 26	18 37	18 44	18 51	19 00	19 11	19 16	19 21	19 28	19 34	19 42
21	18 06	18 15	18 25	18 36	18 42	18 50	18 58	19 09	19 14	19 19	19 25	19 32	19 39
22	18 06	18 15	18 24	18 35	18 41	18 48	18 57	19 07	19 12	19 17	19 23	19 29	19 36
23	18 06	18 14	18 23	18 34	18 40	18 47	18 55	19 05	19 10	19 15	19 20	19 27	19 34
24	18 06	18 14	18 23	18 33	18 39	18 46	18 53	19 03	19 08	19 12	19 18	19 24	19 31
25	18 06	18 13	18 22	18 32	18 38	18 44	18 52	19 01	19 05	19 10	19 15	19 21	19 28
26	18 05	18 13	18 21	18 31	18 36	18 43	18 50	18 59	19 03	19 08	19 13	19 18	19 25
27	18 05	18 12	18 20	18 29	18 35	18 41	18 48	18 57	19 01	19 05	19 10	19 16	19 22
28	18 05	18 12	18 19	18 28	18 34	18 40	18 46	18 55	18 59	19 03	19 08	19 13	19 19
29	18 04	18 11	18 18	18 27	18 32	18 38	18 45	18 53	18 56	19 00	19 05	19 10	19 16
30	18 04	18 10	18 18	18 26	18 31	18 36	18 43	18 51	18 54	18 58	19 02	19 08	19 13
31	18 04	18 10	18 17	18 25	18 30	18 35	18 41	18 48	18 52	18 56	19 00	19 05	19 10
Sept. 1	18 03	18 09	18 16	18 24	18 28	18 33	18 39	18 46	18 50	18 53	18 57	19 02	19 07
2	18 03	18 09	18 15	18 22	18 27	18 32	18 37	18 44	18 48	18 51	18 55	18 59	19 04
3	18 03	18 08	18 14	18 21	18 26	18 30	18 36	18 42	18 45	18 49	18 52	18 56	19 01
4	18 02	18 08	18 13	18 20	18 24	18 28	18 34	18 40	18 43	18 46	18 50	18 54	18 58
5	18 02	18 07	18 13	18 19	18 23	18 27	18 32	18 38	18 41	18 44	18 47	18 51	18 55
6	18 02	18 06	18 12	18 18	18 21	18 25	18 30	18 36	18 38	18 41	18 44	18 48	18 52
7	18 02	18 06	18 11	18 16	18 20	18 24	18 28	18 34	18 36	18 39	18 42	18 45	18 49
8	18 01	18 05	18 10	18 15	18 18	18 22	18 26	18 31	18 34	18 36	18 39	18 42	18 46
9	18 01	18 05	18 09	18 14	18 17	18 20	18 24	18 29	18 31	18 34	18 36	18 40	18 43
10	18 00	18 04	18 08	18 13	18 16	18 19	18 22	18 27	18 29	18 31	18 34	18 37	18 40
11	18 00	18 03	18 07	18 12	18 14	18 17	18 21	18 25	18 27	18 29	18 31	18 34	18 37
12	18 00	18 03	18 06	18 10	18 13	18 16	18 19	18 23	18 24	18 26	18 29	18 31	18 34
13	17 59	18 02	18 05	18 09	18 11	18 14	18 17	18 21	18 22	18 24	18 26	18 28	18 31
14	17 59	18 02	18 04	18 08	18 10	18 12	18 15	18 18	18 20	18 22	18 23	18 26	18 28
15	17 59	18 01	18 04	18 07	18 09	18 11	18 13	18 16	18 18	18 19	18 21	18 23	18 25

ENDING OF EVENING TWILIGHT

Aug. 9	h m 19 20	h m 19 34	h m 19 51	h m 20 15	h m 20 30	h m 20 50	h m 21 16	h m 21 53	h m 22 15	h m 22 45	h m	h m	h m
19	19 18	19 28	19 43	20 03	20 16	20 32	20 53	21 23	21 38	21 57	22 22	23 01	
29	19 14	19 22	19 34	19 50	20 00	20 14	20 31	20 53	21 05	21 19	21 35	21 56	22 24
Sept. 8	19 10	19 16	19 24	19 36	19 44	19 55	20 08	20 26	20 34	20 45	20 56	21 11	21 28
18	19 06	19 09	19 14	19 22	19 28	19 36	19 46	20 00	20 07	20 13	20 22	20 32	20 44

Twilight lasts all night at latitude +60°, Apr. 23-Aug. 22; +58°, Apr. 29-Aug. 16; +56°, May 6-Aug. 9; +54°, May 13-Aug. 2; +52°, May 22-July 24; +50°, June 2-July 12.

LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), AND BEGINNING OF MORNING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Sept. 15	5 52	5 50	5 47	5 44	5 42	5 40	5 37	5 34	5 32	5 31	5 29	5 27	5 25
16	5 52	5 50	5 47	5 44	5 43	5 41	5 38	5 35	5 34	5 33	5 31	5 29	5 27
17	5 52	5 50	5 48	5 45	5 43	5 42	5 40	5 37	5 36	5 34	5 33	5 31	5 30
18	5 51	5 50	5 48	5 46	5 44	5 43	5 41	5 38	5 38	5 36	5 35	5 34	5 32
19	5 51	5 50	5 48	5 46	5 45	5 44	5 42	5 40	5 39	5 38	5 37	5 36	5 34
20	5 50	5 49	5 48	5 46	5 46	5 44	5 43	5 41	5 41	5 40	5 39	5 38	5 37
21	5 50	5 49	5 48	5 47	5 46	5 45	5 44	5 43	5 42	5 42	5 41	5 40	5 39
22	5 50	5 49	5 49	5 48	5 47	5 46	5 46	5 44	5 44	5 43	5 43	5 42	5 41
23	5 50	5 49	5 49	5 48	5 48	5 47	5 47	5 46	5 46	5 45	5 45	5 44	5 44
24	5 49	5 49	5 49	5 49	5 48	5 48	5 48	5 47	5 47	5 47	5 47	5 46	5 46
25	5 49	5 49	5 49	5 49	5 49	5 49	5 49	5 49	5 49	5 49	5 49	5 48	5 48
26	5 48	5 49	5 49	5 50	5 50	5 50	5 50	5 50	5 50	5 51	5 51	5 51	5 51
27	5 48	5 49	5 50	5 50	5 51	5 51	5 52	5 52	5 52	5 52	5 53	5 53	5 53
28	5 48	5 49	5 50	5 51	5 52	5 52	5 53	5 54	5 54	5 54	5 55	5 55	5 56
29	5 47	5 49	5 50	5 52	5 52	5 53	5 54	5 55	5 56	5 56	5 57	5 57	5 58
Oct. 30	5 47	5 49	5 50	5 52	5 53	5 54	5 55	5 57	5 57	5 58	5 59	5 59	6 00
1	5 47	5 49	5 51	5 53	5 54	5 55	5 56	5 58	5 59	6 00	6 01	6 02	6 03
2	5 46	5 49	5 51	5 53	5 55	5 56	5 58	6 00	6 00	6 02	6 03	6 04	6 05
3	5 46	5 49	5 51	5 54	5 55	5 57	5 59	6 01	6 02	6 03	6 05	6 06	6 08
4	5 46	5 49	5 51	5 54	5 56	5 58	6 00	6 03	6 04	6 05	6 07	6 08	6 10
5	5 46	5 48	5 52	5 55	5 57	5 59	6 01	6 04	6 06	6 07	6 09	6 10	6 12
6	5 45	5 48	5 52	5 56	5 58	6 00	6 03	6 06	6 07	6 09	6 11	6 12	6 15
7	5 45	5 48	5 52	5 56	5 58	6 01	6 04	6 07	6 09	6 11	6 13	6 15	6 17
8	5 45	5 48	5 52	5 57	5 59	6 02	6 05	6 09	6 11	6 13	6 15	6 17	6 19
9	5 44	5 48	5 53	5 57	6 00	6 03	6 06	6 11	6 12	6 14	6 17	6 19	6 22
10	5 44	5 48	5 53	5 58	6 01	6 04	6 08	6 12	6 14	6 16	6 19	6 21	6 24
11	5 44	5 48	5 53	5 58	6 02	6 05	6 09	6 14	6 16	6 18	6 21	6 24	6 27
12	5 44	5 48	5 54	5 59	6 02	6 06	6 10	6 15	6 18	6 20	6 23	6 26	6 29
13	5 43	5 48	5 54	6 00	6 03	6 07	6 12	6 17	6 19	6 22	6 25	6 28	6 32
14	5 43	5 48	5 54	6 00	6 04	6 08	6 13	6 18	6 21	6 24	6 27	6 30	6 34
15	5 43	5 48	5 54	6 01	6 05	6 09	6 14	6 20	6 23	6 26	6 29	6 32	6 36
16	5 43	5 49	5 55	6 02	6 06	6 10	6 16	6 22	6 24	6 28	6 31	6 35	6 39
17	5 42	5 49	5 55	6 02	6 07	6 11	6 17	6 23	6 26	6 29	6 33	6 37	6 41
18	5 42	5 49	5 56	6 03	6 08	6 12	6 18	6 25	6 28	6 31	6 35	6 39	6 44
19	5 42	5 49	5 56	6 04	6 08	6 13	6 19	6 26	6 30	6 33	6 37	6 42	6 46
20	5 42	5 49	5 56	6 04	6 09	6 14	6 21	6 28	6 31	6 35	6 39	6 44	6 49
21	5 42	5 49	5 57	6 05	6 10	6 16	6 22	6 30	6 33	6 37	6 41	6 46	6 51

BEGINNING OF MORNING TWILIGHT

Sept. 8	4 46	4 40	4 31	4 19	4 10	3 59	3 46	3 28	3 19	3 08	2 56	2 41	2 23
18	4 42	4 40	4 34	4 25	4 19	4 11	4 01	3 47	3 40	3 33	3 24	3 13	3 00
Oct. 28	4 39	4 39	4 36	4 31	4 28	4 22	4 15	4 05	4 01	3 55	3 48	3 41	3 32
8	4 36	4 38	4 39	4 37	4 35	4 32	4 28	4 22	4 18	4 15	4 10	4 06	4 00
18	4 32	4 38	4 42	4 43	4 43	4 42	4 40	4 37	4 36	4 34	4 31	4 28	4 25
28	4 30	4 39	4 45	4 50	4 51	4 52	4 53	4 53	4 52	4 52	4 51	4 50	4 48

SUNSET, 1935

657

LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), AND ENDING OF EVENING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Sept. 15	h m 17 59	h m 18 01	h m 18 04	h m 18 07	h m 18 09	h m 18 11	h m 18 13	h m 18 16	h m 18 18	h m 18 19	h m 18 21	h m 18 23	h m 18 25
16	17 58	18 00	18 03	18 05	18 07	18 09	18 11	18 14	18 15	18 16	18 18	18 20	18 22
17	17 58	18 00	18 02	18 04	18 06	18 07	18 09	18 12	18 13	18 14	18 15	18 17	18 18
18	17 58	17 59	18 01	18 03	18 04	18 06	18 07	18 10	18 10	18 11	18 13	18 14	18 15
19	17 57	17 58	18 00	18 02	18 03	18 04	18 05	18 07	18 08	18 09	18 10	18 11	18 12
20	17 57	17 58	17 59	18 00	18 01	18 02	18 04	18 05	18 06	18 06	18 07	18 08	18 09
21	17 56	17 57	17 58	17 59	18 00	18 01	18 02	18 03	18 03	18 04	18 04	18 06	18 06
22	17 56	17 57	17 57	17 58	17 58	17 59	18 00	18 01	18 01	18 02	18 02	18 03	18 03
23	17 56	17 56	17 56	17 57	17 57	17 57	17 58	17 58	17 59	17 59	17 59	18 00	18 00
24	17 56	17 55	17 55	17 56	17 56	17 56	17 56	17 56	17 56	17 56	17 57	17 57	17 57
25	17 55	17 55	17 54	17 54	17 54	17 54	17 54	17 54	17 54	17 54	17 54	17 54	17 54
26	17 55	17 54	17 54	17 53	17 53	17 52	17 52	17 52	17 52	17 52	17 51	17 51	17 51
27	17 54	17 54	17 53	17 52	17 51	17 51	17 50	17 50	17 49	17 49	17 49	17 48	17 48
28	17 54	17 53	17 52	17 50	17 50	17 49	17 48	17 47	17 47	17 46	17 46	17 46	17 45
29	17 54	17 52	17 51	17 49	17 48	17 48	17 46	17 45	17 45	17 44	17 43	17 43	17 42
Oct. 30	17 54	17 52	17 50	17 48	17 47	17 46	17 44	17 43	17 42	17 42	17 41	17 40	17 39
1	17 53	17 51	17 49	17 47	17 46	17 44	17 43	17 41	17 40	17 39	17 38	17 37	17 36
2	17 53	17 50	17 48	17 46	17 44	17 43	17 41	17 39	17 38	17 37	17 36	17 34	17 33
3	17 52	17 50	17 47	17 44	17 43	17 41	17 39	17 36	17 35	17 34	17 33	17 32	17 30
4	17 52	17 49	17 46	17 43	17 42	17 39	17 37	17 34	17 33	17 32	17 30	17 29	17 27
5	17 52	17 49	17 46	17 42	17 40	17 38	17 35	17 32	17 31	17 29	17 28	17 26	17 24
6	17 52	17 48	17 45	17 41	17 39	17 36	17 33	17 30	17 28	17 27	17 25	17 23	17 21
7	17 51	17 48	17 44	17 40	17 37	17 35	17 32	17 28	17 26	17 24	17 22	17 20	17 18
8	17 51	17 47	17 43	17 38	17 36	17 33	17 30	17 26	17 24	17 22	17 20	17 18	17 15
9	17 51	17 46	17 42	17 37	17 34	17 31	17 28	17 24	17 22	17 20	17 17	17 15	17 12
10	17 50	17 46	17 41	17 36	17 33	17 30	17 26	17 22	17 20	17 17	17 15	17 12	17 09
11	17 50	17 45	17 40	17 35	17 32	17 28	17 24	17 19	17 17	17 15	17 12	17 09	17 06
12	17 50	17 45	17 40	17 34	17 30	17 27	17 22	17 17	17 15	17 12	17 10	17 06	17 03
13	17 50	17 44	17 39	17 33	17 29	17 25	17 21	17 15	17 13	17 10	17 07	17 04	17 00
14	17 50	17 44	17 38	17 32	17 28	17 24	17 19	17 13	17 11	17 08	17 05	17 01	16 57
15	17 49	17 43	17 37	17 30	17 27	17 22	17 17	17 11	17 08	17 05	17 02	16 58	16 54
16	17 49	17 43	17 37	17 29	17 25	17 21	17 15	17 09	17 06	17 03	17 00	16 56	16 51
17	17 49	17 42	17 36	17 28	17 24	17 19	17 14	17 07	17 04	17 01	16 57	16 53	16 48
18	17 49	17 42	17 35	17 27	17 23	17 18	17 12	17 05	17 02	16 58	16 55	16 50	16 46
19	17 48	17 42	17 34	17 26	17 22	17 16	17 10	17 03	17 00	16 56	16 52	16 48	16 43
20	17 48	17 41	17 34	17 25	17 20	17 15	17 08	17 01	16 58	16 54	16 50	16 45	16 40
21	17 48	17 41	17 33	17 24	17 19	17 13	17 07	16 59	16 56	16 52	16 47	16 42	16 37

ENDING OF EVENING TWILIGHT

Sept. 8	h m 19 10	h m 19 16	h m 19 24	h m 19 36	h m 19 44	h m 19 55	h m 20 08	h m 20 26	h m 20 34	h m 20 45	h m 20 56	h m 21 11	h m 21 28
18	19 06	19 09	19 14	19 22	19 28	19 36	19 46	20 00	20 07	20 13	20 22	20 32	20 44
28	19 03	19 02	19 05	19 09	19 13	19 18	19 25	19 35	19 39	19 45	19 51	19 58	20 06
Oct. 8	19 00	18 57	18 56	18 57	18 59	19 02	19 06	19 12	19 15	19 19	19 23	19 27	19 33
18	18 58	18 52	18 48	18 47	18 46	18 47	18 49	18 51	18 53	18 55	18 57	19 00	19 03
28	18 58	18 49	18 42	18 37	18 36	18 34	18 34	18 34	18 34	18 35	18 35	18 36	18 37

LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), AND BEGINNING OF MORNING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Oct. 21	5 42	5 49	5 57	6 05	6 10	6 16	6 22	6 30	6 33	6 37	6 41	6 46	6 51
22	5 41	5 49	5 57	6 06	6 11	6 17	6 23	6 31	6 35	6 39	6 43	6 48	6 54
23	5 41	5 49	5 57	6 06	6 12	6 18	6 25	6 33	6 37	6 41	6 45	6 51	6 56
24	5 41	5 49	5 58	6 07	6 13	6 19	6 26	6 35	6 38	6 43	6 48	6 53	6 59
25	5 41	5 50	5 58	6 08	6 14	6 20	6 28	6 36	6 40	6 45	6 50	6 55	7 02
26	5 41	5 50	5 59	6 09	6 14	6 21	6 29	6 38	6 42	6 47	6 52	6 58	7 04
27	5 41	5 50	5 59	6 10	6 15	6 22	6 30	6 40	6 44	6 49	6 54	7 00	7 06
28	5 41	5 50	5 59	6 10	6 16	6 23	6 32	6 41	6 46	6 51	6 56	7 02	7 09
29	5 40	5 50	6 00	6 11	6 17	6 24	6 33	6 43	6 47	6 53	6 58	7 04	7 12
30	5 40	5 50	6 00	6 12	6 18	6 26	6 34	6 44	6 49	6 55	7 00	7 07	7 14
Nov. 31	5 40	5 50	6 01	6 12	6 19	6 27	6 36	6 46	6 51	6 56	7 02	7 09	7 17
1	5 40	5 50	6 01	6 13	6 20	6 28	6 37	6 48	6 53	6 58	7 05	7 12	7 19
2	5 40	5 51	6 02	6 14	6 21	6 29	6 38	6 50	6 55	7 00	7 07	7 14	7 22
3	5 40	5 51	6 02	6 15	6 22	6 30	6 40	6 51	6 56	7 02	7 09	7 16	7 24
4	5 40	5 51	6 02	6 16	6 23	6 31	6 41	6 53	6 58	7 04	7 11	7 18	7 27
5	5 40	5 51	6 03	6 16	6 24	6 32	6 42	6 54	7 00	7 06	7 13	7 21	7 30
6	5 40	5 52	6 04	6 17	6 25	6 34	6 44	6 56	7 02	7 08	7 15	7 23	7 32
7	5 40	5 52	6 04	6 18	6 26	6 35	6 45	6 58	7 04	7 10	7 17	7 26	7 35
8	5 40	5 52	6 04	6 19	6 27	6 36	6 47	7 00	7 06	7 12	7 20	7 28	7 37
9	5 40	5 52	6 05	6 19	6 28	6 37	6 48	7 01	7 07	7 14	7 22	7 30	7 40
10	5 40	5 53	6 06	6 20	6 29	6 38	6 49	7 03	7 09	7 16	7 24	7 32	7 42
11	5 41	5 53	6 06	6 21	6 30	6 39	6 51	7 04	7 11	7 18	7 26	7 35	7 45
12	5 41	5 53	6 06	6 22	6 31	6 40	6 52	7 06	7 13	7 20	7 28	7 37	7 48
13	5 41	5 54	6 07	6 23	6 32	6 42	6 53	7 08	7 14	7 22	7 30	7 39	7 50
14	5 41	5 54	6 08	6 24	6 33	6 43	6 55	7 09	7 16	7 24	7 32	7 42	7 53
15	5 41	5 54	6 08	6 24	6 34	6 44	6 56	7 11	7 18	7 26	7 34	7 44	7 55
16	5 41	5 55	6 09	6 25	6 34	6 45	6 58	7 13	7 20	7 28	7 36	7 46	7 58
17	5 41	5 55	6 10	6 26	6 35	6 46	6 59	7 14	7 22	7 29	7 38	7 48	8 00
18	5 42	5 56	6 10	6 27	6 36	6 47	7 00	7 16	7 23	7 31	7 40	7 51	8 03
19	5 42	5 56	6 11	6 28	6 37	6 48	7 02	7 18	7 25	7 33	7 42	7 53	8 05
20	5 42	5 56	6 11	6 28	6 38	6 50	7 03	7 19	7 27	7 35	7 44	7 55	8 08
21	5 42	5 57	6 12	6 29	6 39	6 51	7 04	7 21	7 28	7 37	7 46	7 57	8 10
22	5 42	5 57	6 13	6 30	6 40	6 52	7 06	7 22	7 30	7 39	7 48	8 00	8 12
23	5 43	5 58	6 13	6 31	6 41	6 53	7 07	7 24	7 32	7 40	7 50	8 02	8 15
24	5 43	5 58	6 14	6 32	6 42	6 54	7 08	7 25	7 33	7 42	7 52	8 04	8 17
25	5 43	5 58	6 14	6 33	6 43	6 55	7 09	7 27	7 35	7 44	7 54	8 06	8 20
26	5 44	5 59	6 15	6 34	6 44	6 56	7 11	7 28	7 37	7 46	7 56	8 08	8 22

BEGINNING OF MORNING TWILIGHT

Oct. 18	4 32	4 38	4 42	4 43	4 43	4 42	4 40	4 37	4 36	4 34	4 31	4 28	4 25
28	4 30	4 39	4 45	4 50	4 51	4 52	4 53	4 53	4 52	4 52	4 51	4 50	4 48
Nov. 7	4 29	4 40	4 49	4 56	5 00	5 02	5 05	5 07	5 08	5 09	5 09	5 10	5 10
17	4 29	4 42	4 53	5 03	5 08	5 12	5 17	5 21	5 23	5 25	5 26	5 28	5 30
27	4 30	4 45	4 58	5 10	5 16	5 22	5 28	5 34	5 37	5 39	5 42	5 45	5 48

SUNSET, 1935

659

LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), AND ENDING OF EVENING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Oct.	21	17 48	17 41	17 33	17 24	17 19	17 13	17 07	16 59	16 56	16 52	16 47	16 42	16 37
	22	17 48	17 40	17 32	17 23	17 18	17 12	17 05	16 57	16 53	16 49	16 45	16 40	16 34
	23	17 48	17 40	17 32	17 22	17 17	17 11	17 04	16 55	16 51	16 47	16 42	16 37	16 31
	24	17 48	17 39	17 31	17 21	17 16	17 09	17 02	16 53	16 49	16 45	16 40	16 35	16 28
	25	17 48	17 39	17 30	17 20	17 14	17 08	17 00	16 51	16 47	16 43	16 38	16 32	16 26
	26	17 47	17 39	17 30	17 19	17 13	17 07	16 59	16 50	16 45	16 40	16 35	16 30	16 23
	27	17 47	17 38	17 29	17 18	17 12	17 05	16 57	16 48	16 43	16 38	16 33	16 27	16 20
	28	17 47	17 38	17 28	17 17	17 11	17 04	16 56	16 46	16 41	16 36	16 31	16 24	16 18
	29	17 47	17 38	17 28	17 16	17 10	17 03	16 54	16 44	16 39	16 34	16 28	16 22	16 15
	30	17 47	17 37	17 27	17 16	17 09	17 02	16 53	16 42	16 38	16 32	16 26	16 20	16 12
Nov.	31	17 47	17 37	17 27	17 15	17 08	17 00	16 51	16 40	16 36	16 30	16 24	16 17	16 10
	1	17 47	17 37	17 26	17 14	17 07	16 59	16 50	16 39	16 34	16 28	16 22	16 15	16 07
	2	17 47	17 37	17 26	17 13	17 06	16 58	16 48	16 37	16 32	16 26	16 20	16 12	16 04
	3	17 47	17 36	17 25	17 12	17 05	16 57	16 47	16 35	16 30	16 24	16 18	16 10	16 02
	4	17 47	17 36	17 25	17 12	17 04	16 56	16 46	16 34	16 28	16 22	16 15	16 08	15 59
	5	17 47	17 36	17 24	17 11	17 03	16 54	16 44	16 32	16 26	16 20	16 13	16 05	15 56
	6	17 47	17 36	17 24	17 10	17 02	16 53	16 43	16 30	16 25	16 18	16 11	16 03	15 54
	7	17 47	17 36	17 23	17 09	17 01	16 52	16 42	16 29	16 23	16 16	16 09	16 01	15 52
	8	17 47	17 35	17 23	17 09	17 00	16 51	16 40	16 27	16 21	16 15	16 07	15 59	15 49
	9	17 47	17 35	17 22	17 08	17 00	16 50	16 39	16 26	16 20	16 13	16 05	15 56	15 47
	10	17 48	17 35	17 22	17 07	16 59	16 49	16 38	16 24	16 18	16 11	16 03	15 54	15 44
	11	17 48	17 35	17 22	17 07	16 58	16 48	16 37	16 23	16 16	16 09	16 01	15 52	15 42
	12	17 48	17 35	17 21	17 06	16 57	16 47	16 36	16 21	16 15	16 08	15 59	15 50	15 40
	13	17 48	17 35	17 21	17 06	16 57	16 46	16 34	16 20	16 13	16 06	15 58	15 48	15 37
	14	17 48	17 35	17 21	17 05	16 56	16 46	16 33	16 19	16 12	16 04	15 56	15 46	15 35
	15	17 48	17 35	17 20	17 04	16 55	16 45	16 32	16 17	16 10	16 03	15 54	15 44	15 33
	16	17 48	17 35	17 20	17 04	16 55	16 44	16 31	16 16	16 09	16 01	15 52	15 42	15 31
	17	17 48	17 35	17 20	17 04	16 54	16 43	16 30	16 15	16 08	16 00	15 51	15 40	15 28
	18	17 49	17 35	17 20	17 03	16 53	16 42	16 29	16 14	16 06	15 58	15 49	15 38	15 26
	19	17 49	17 35	17 20	17 03	16 53	16 42	16 28	16 12	16 05	15 57	15 47	15 37	15 24
	20	17 49	17 35	17 20	17 02	16 52	16 41	16 28	16 11	16 04	15 55	15 46	15 35	15 22
	21	17 49	17 35	17 20	17 02	16 52	16 40	16 27	16 10	16 02	15 54	15 44	15 33	15 20
	22	17 50	17 35	17 19	17 02	16 51	16 40	16 26	16 09	16 01	15 53	15 43	15 32	15 19
	23	17 50	17 35	17 19	17 01	16 51	16 39	16 25	16 08	16 00	15 51	15 41	15 30	15 17
	24	17 50	17 35	17 19	17 01	16 50	16 39	16 24	16 07	15 59	15 50	15 40	15 28	15 15
	25	17 51	17 35	17 19	17 01	16 50	16 38	16 24	16 06	15 58	15 49	15 39	15 27	15 13
	26	17 51	17 35	17 19	17 01	16 50	16 38	16 23	16 06	15 57	15 48	15 38	15 26	15 12

ENDING OF EVENING TWILIGHT

Oct.	18	18 58	18 52	18 48	18 47	18 46	18 47	18 49	18 51	18 53	18 55	18 57	19 00	19 03
	28	18 58	18 49	18 42	18 37	18 36	18 34	18 34	18 34	18 34	18 35	18 35	18 36	18 37
Nov.	7	18 59	18 48	18 38	18 31	18 27	18 24	18 21	18 19	18 18	18 17	18 17	18 16	18 15
	17	19 01	18 48	18 36	18 26	18 21	18 17	18 12	18 07	18 06	18 04	18 02	18 00	17 58
	27	19 05	18 50	18 37	18 24	18 18	18 13	18 06	18 00	17 57	17 55	17 52	17 49	17 46

SUNRISE, 1935

LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), AND BEGINNING OF MORNING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Nov. 26	5 44	5 59	6 15	6 34	6 44	6 56	7 11	7 28	7 37	7 46	7 56	8 08	8 22
27	5 44	5 59	6 16	6 34	6 45	6 57	7 12	7 30	7 38	7 47	7 58	8 10	8 24
28	5 44	6 00	6 16	6 35	6 46	6 58	7 13	7 31	7 40	7 49	8 00	8 12	8 26
29	5 44	6 00	6 17	6 36	6 47	7 00	7 14	7 33	7 41	7 51	8 02	8 14	8 29
30	5 45	6 01	6 18	6 37	6 48	7 01	7 16	7 34	7 43	7 52	8 03	8 16	8 31
Dec. 1	5 45	6 01	6 18	6 38	6 49	7 02	7 17	7 35	7 44	7 54	8 05	8 18	8 33
2	5 46	6 02	6 19	6 38	6 50	7 03	7 18	7 37	7 46	7 56	8 07	8 20	8 35
3	5 46	6 02	6 20	6 39	6 51	7 04	7 19	7 38	7 47	7 57	8 08	8 22	8 37
4	5 46	6 03	6 20	6 40	6 51	7 05	7 20	7 39	7 48	7 58	8 10	8 23	8 39
5	5 47	6 03	6 21	6 41	6 52	7 06	7 21	7 41	7 50	8 00	8 12	8 25	8 41
6	5 47	6 04	6 21	6 42	6 53	7 07	7 22	7 42	7 51	8 01	8 13	8 27	8 43
7	5 48	6 04	6 22	6 42	6 54	7 08	7 24	7 43	7 52	8 03	8 14	8 28	8 44
8	5 48	6 05	6 23	6 43	6 55	7 08	7 25	7 44	7 54	8 04	8 16	8 30	8 46
9	5 48	6 05	6 23	6 44	6 56	7 09	7 26	7 45	7 55	8 05	8 17	8 31	8 48
10	5 49	6 06	6 24	6 44	6 56	7 10	7 27	7 46	7 56	8 07	8 19	8 33	8 49
11	5 49	6 06	6 24	6 45	6 57	7 11	7 27	7 47	7 57	8 08	8 20	8 34	8 51
12	5 50	6 07	6 25	6 46	6 58	7 12	7 28	7 48	7 58	8 09	8 21	8 35	8 52
13	5 50	6 07	6 26	6 46	6 59	7 13	7 29	7 49	7 59	8 10	8 22	8 37	8 54
14	5 51	6 08	6 26	6 47	6 59	7 13	7 30	7 50	8 00	8 11	8 23	8 38	8 55
15	5 51	6 08	6 27	6 48	7 00	7 14	7 31	7 51	8 01	8 12	8 24	8 39	8 56
16	5 52	6 09	6 27	6 48	7 01	7 15	7 32	7 52	8 02	8 13	8 25	8 40	8 57
17	5 52	6 10	6 28	6 49	7 01	7 16	7 32	7 53	8 03	8 14	8 26	8 41	8 58
18	5 53	6 10	6 28	6 50	7 02	7 16	7 33	7 54	8 04	8 14	8 27	8 42	8 59
19	5 53	6 10	6 29	6 50	7 03	7 17	7 34	7 54	8 04	8 15	8 28	8 43	9 00
20	5 54	6 11	6 30	6 51	7 03	7 17	7 34	7 55	8 05	8 16	8 29	8 43	9 01
21	5 54	6 12	6 30	6 51	7 04	7 18	7 35	7 56	8 06	8 17	8 29	8 44	9 02
22	5 55	6 12	6 31	6 52	7 04	7 18	7 35	7 56	8 06	8 17	8 30	8 45	9 02
23	5 55	6 12	6 31	6 52	7 05	7 19	7 36	7 57	8 07	8 18	8 30	8 45	9 03
24	5 56	6 13	6 32	6 53	7 05	7 19	7 36	7 57	8 07	8 18	8 31	8 46	9 03
25	5 56	6 13	6 32	6 53	7 06	7 20	7 37	7 57	8 07	8 18	8 31	8 46	9 04
26	5 57	6 14	6 32	6 54	7 06	7 20	7 37	7 58	8 08	8 19	8 32	8 46	9 04
27	5 57	6 14	6 33	6 54	7 06	7 21	7 37	7 58	8 08	8 19	8 32	8 46	9 04
28	5 58	6 15	6 33	6 55	7 07	7 21	7 38	7 58	8 08	8 19	8 32	8 47	9 04
29	5 58	6 15	6 34	6 55	7 07	7 21	7 38	7 59	8 08	8 20	8 32	8 47	9 04
30	5 58	6 16	6 34	6 55	7 08	7 22	7 38	7 59	8 08	8 20	8 32	8 47	9 04
31	5 59	6 16	6 35	6 56	7 08	7 22	7 38	7 59	8 08	8 20	8 32	8 46	9 04
32	6 00	6 17	6 35	6 56	7 08	7 22	7 39	7 59	8 08	8 20	8 32	8 46	9 03

BEGINNING OF MORNING TWILIGHT

Nov. 17	4 29	4 42	4 53	5 03	5 08	5 12	5 17	5 21	5 23	5 25	5 26	5 28	5 30
27	4 30	4 45	4 58	5 10	5 16	5 22	5 28	5 34	5 37	5 39	5 42	5 45	5 48
Dec. 7	4 33	4 49	5 04	5 17	5 24	5 31	5 38	5 45	5 48	5 51	5 55	5 58	6 02
17	4 37	4 54	5 09	5 24	5 31	5 38	5 45	5 53	5 57	6 01	6 05	6 09	6 13
27	4 42	4 59	5 14	5 29	5 36	5 43	5 51	5 59	6 02	6 06	6 10	6 14	6 18
32	4 45	5 01	5 16	5 31	5 38	5 45	5 52	6 00	6 03	6 07	6 10	6 14	6 18

SUNSET, 1935

661

LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), AND ENDING OF EVENING TWILIGHT, MERIDIAN OF GREENWICH, 1935

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian. For southern latitudes see page 662.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Nov. 26	17 51	17 35	17 19	17 01	16 50	16 38	16 23	16 06	15 57	15 48	15 38	15 26	15 12
27	17 51	17 36	17 19	17 00	16 50	16 37	16 22	16 05	15 56	15 47	15 36	15 24	15 10
28	17 51	17 36	17 19	17 00	16 49	16 37	16 22	16 04	15 55	15 46	15 35	15 23	15 08
29	17 52	17 36	17 19	17 00	16 49	16 36	16 21	16 03	15 54	15 45	15 34	15 22	15 07
30	17 52	17 36	17 19	17 00	16 49	16 36	16 21	16 02	15 54	15 44	15 33	15 20	15 05
Dec. 1	17 52	17 36	17 19	17 00	16 49	16 36	16 20	16 02	15 53	15 43	15 32	15 19	15 04
2	17 53	17 37	17 20	17 00	16 48	16 36	16 20	16 01	15 52	15 42	15 31	15 18	15 03
3	17 53	17 37	17 20	17 00	16 48	16 35	16 20	16 01	15 52	15 42	15 30	15 17	15 02
4	17 54	17 37	17 20	17 00	16 48	16 35	16 19	16 00	15 51	15 41	15 30	15 16	15 00
5	17 54	17 38	17 20	17 00	16 48	16 35	16 19	16 00	15 51	15 40	15 29	15 15	14 59
6	17 54	17 38	17 20	17 00	16 48	16 35	16 19	15 59	15 50	15 40	15 28	15 14	14 58
7	17 55	17 38	17 20	17 00	16 48	16 35	16 19	15 59	15 50	15 39	15 27	15 14	14 57
8	17 55	17 38	17 21	17 00	16 48	16 35	16 18	15 59	15 49	15 39	15 27	15 13	14 57
9	17 56	17 39	17 21	17 00	16 48	16 35	16 18	15 58	15 49	15 38	15 26	15 12	14 56
10	17 56	17 39	17 21	17 00	16 48	16 35	16 18	15 58	15 49	15 38	15 26	15 12	14 55
11	17 57	17 40	17 22	17 01	16 49	16 35	16 18	15 58	15 49	15 38	15 26	15 11	14 55
12	17 57	17 40	17 22	17 01	16 49	16 35	16 18	15 58	15 48	15 38	15 25	15 11	14 54
13	17 58	17 40	17 22	17 01	16 49	16 35	16 18	15 58	15 48	15 38	15 25	15 11	14 54
14	17 58	17 41	17 22	17 02	16 49	16 35	16 19	15 58	15 48	15 38	15 25	15 11	14 54
15	17 58	17 41	17 23	17 02	16 50	16 36	16 19	15 58	15 48	15 38	15 25	15 10	14 53
16	17 59	17 42	17 23	17 02	16 50	16 36	16 19	15 58	15 49	15 38	15 25	15 10	14 53
17	18 00	17 42	17 24	17 02	16 50	16 36	16 19	15 59	15 49	15 38	15 25	15 10	14 53
18	18 00	17 42	17 24	17 03	16 50	16 36	16 20	15 59	15 49	15 38	15 25	15 10	14 53
19	18 00	17 43	17 25	17 03	16 51	16 37	16 20	15 59	15 49	15 38	15 25	15 11	14 53
20	18 01	17 44	17 25	17 04	16 51	16 37	16 20	16 00	15 50	15 38	15 26	15 11	14 53
21	18 02	17 44	17 26	17 04	16 52	16 38	16 21	16 00	15 50	15 39	15 26	15 11	14 54
22	18 02	17 44	17 26	17 05	16 52	16 38	16 21	16 00	15 50	15 39	15 27	15 12	14 54
23	18 02	17 45	17 26	17 05	16 53	16 39	16 22	16 01	15 51	15 40	15 27	15 12	14 55
24	18 03	17 46	17 27	17 06	16 53	16 39	16 22	16 02	15 52	15 40	15 28	15 13	14 55
25	18 03	17 46	17 28	17 06	16 54	16 40	16 23	16 02	15 52	15 41	15 28	15 14	14 56
26	18 04	17 47	17 28	17 07	16 54	16 40	16 24	16 03	15 53	15 42	15 29	15 14	14 57
27	18 04	17 47	17 29	17 07	16 55	16 41	16 24	16 04	15 54	15 43	15 30	15 15	14 58
28	18 05	17 48	17 29	17 08	16 56	16 42	16 25	16 04	15 54	15 43	15 31	15 16	14 59
29	18 06	17 48	17 30	17 09	16 56	16 42	16 26	16 05	15 55	15 44	15 32	15 17	15 00
30	18 06	17 49	17 30	17 09	16 57	16 43	16 26	16 06	15 56	15 45	15 33	15 18	15 01
31	18 06	17 49	17 31	17 10	16 58	16 44	16 27	16 07	15 57	15 46	15 34	15 19	15 02
32	18 07	17 50	17 32	17 11	16 59	16 45	16 28	16 08	15 58	15 47	15 35	15 21	15 04

ENDING OF EVENING TWILIGHT

Nov. 17	19 01	18 48	18 36	18 26	18 21	18 17	18 12	18 07	18 06	18 04	18 02	18 00	17 58
27	19 05	18 50	18 37	18 24	18 18	18 13	18 06	18 00	17 57	17 55	17 52	17 49	17 46
Dec. 7	19 10	18 53	18 39	18 25	18 18	18 12	18 04	17 57	17 54	17 51	17 47	17 43	17 40
17	19 15	18 58	18 42	18 28	18 21	18 14	18 06	17 58	17 55	17 51	17 47	17 43	17 39
27	19 20	19 03	18 48	18 33	18 26	18 19	18 11	18 03	18 00	17 56	17 52	17 48	17 44
32	19 22	19 05	18 50	18 36	18 29	18 22	18 15	18 07	18 04	18 00	17 57	17 53	17 49

SUNRISE AND SUNSET, 1935

SUNRISE, SUNSET, AND TWILIGHT FOR SOUTHERN LATITUDES, 1935

In the case of a southern latitude, the time of sunrise, sunset, or beginning or ending of twilight is taken from the main table, with the corresponding northern latitude, not for the given date but for a date about six months earlier or later, which is to be found in the following table. The time taken from the main table must be corrected by the quantity given in the auxiliary table below on the same line as the given date.

Example.—1935, May 5, in latitude—38°, required the times of sunrise, sunset, and beginning and ending of twilight.

The auxiliary table gives November 7 as the corresponding date, northern latitude, while the correction is +13^m.

				<i>Beginning of Twilight</i>	<i>Sunrise</i>	<i>Sunset</i>	<i>Ending of Twilight</i>
				^h ^m	^h ^m	^h ^m	^h ^m
Main table, Lat. + 38°, Nov. 7	...	...	...	05 01	06 31	16 56	18 25
Auxiliary table	...	...	...	+13	+13	+13	+13
Local mean time, May 5	...	...	...	05 14	06 44	17 09	18 38

The periods during which twilight lasts all night in southern latitudes may be found by substituting for the northern latitudes given in the footnotes, pages 648–655, the corresponding southern latitudes, and for the dates given in those footnotes, the corresponding dates taken from the auxiliary table.

Given Date	Corresponding Date, Northern Latitude	Correction	Given Date	Corresponding Date, Northern Latitude	Correction	Given Date	Corresponding Date, Northern Latitude	Correction	Given Date	Corresponding Date, Northern Latitude	Correction
Jan. 1	July 1	—1 ^m	Feb. 5	Aug. 9	+9 ^m	Mar. 13	Sept. 15	+14 ^m	Apr. 18	Oct. 21	+15 ^m
2	2	0	6	10	9	14	16	14	19	22	15
3	4	0	7	11	9	15	17	14	20	23	15
4	5	0	8	12	9	16	18	15	21	24	14
	6	0	9	13	9	17	19	15	22	25	14
5	7	+1	10	14	+10	18	20	+15	23	26	+14
6	8	1	11	15	10	19	21	15	24	27	14
7	9	1	12	16	10	20	22	15	25	28	14
8	10	1	13	17	10	21	23	15	26	29	14
9	11	2	14	18	10	22	24	15	27	30	14
10	12	+2	15	19	+11	23	25	+15	28	31	+14
11	13	2	16	20	11	24	26	15	29	Nov. 1	14
12	14	3	17	21	11	25	27	15	30	2	14
13	15	3	18	22	11	26	28	15	May 1	3	13
14	16	3	19	24	12	27	29	15	2	4	13
15	17	+3	20	25	+12	28	Oct. 1	+15	3	5	+13
16	19	4	21	26	12	29	2	15	4	6	13
17	20	4	22	27	12	30	3	15	5	7	13
18	21	4	23	28	12	31	4	15	6	8	13
19	22	4	24	29	12	Apr. 1	5	15	7	9	13
20	23	+5	25	30	+12	2	6	+15	8	10	+13
21	24	5	26	31	13	3	7	15	9	11	12
22	25	5	27	Sept. 1	13	4	8	15	10	12	12
23	26	5	28	2	13	5	9	15	11	13	12
24	27	6	Mar. 1	3	13	6	10	15	12	14	12
25	28	+6	2	4	+13	7	11	+15	13	15	+12
26	29	6	3	5	13	8	12	15	14	16	12
27	30	6	4	6	13	9	12	15	15	17	11
28	31	7	5	7	14	10	13	15	16	17	11
29	Aug. 1	7	6	8	14	11	14	15	17	18	11
30	2	+7	7	9	+14	12	15	+15	18	19	+11
31	4	7	8	10	14	13	16	15	19	20	11
Feb. 1	5	8	9	11	14	14	17	15	20	21	11
2	6	8	10	12	14	15	18	15	21	22	10
3	7	8	11	13	14	16	19	15	22	23	10
4	8	+8	12	14	+14	17	20	+15	23	24	+10

SUNRISE AND SUNSET, 1935

663

SUNRISE, SUNSET, AND TWILIGHT FOR SOUTHERN LATITUDES, 1935

Given Date	Corresponding Date, Northern Latitude	Correc-tion	Given Date	Corresponding Date, Northern Latitude	Correc-tion	Given Date	Corresponding Date, Northern Latitude	Correc-tion	Given Date	Corresponding Date, Northern Latitude	Correc-tion
May 24	Nov. 25	+10 ^m	July 19	Jan. 16	-4 ^m	Sept. 13	Mar. 11	-14 ^m	Nov. 8	May 6	-13 ^m
25	26	10	20	17	4	14	12	14	9	7	13
26	27	9	21	18	4	15	13	14	10	8	12
27	28	9	22	19	4	16	14	14	11	9	12
28	29	9	23	20	5	17	15	15	12	10	12
29	30	+9	24	21	-5	18	16	-15	13	11	-12
30	Dec. 1	8	25	22	5	19	17	15	14	12	12
June 1	2	8	26	23	6	20	18	15	15	13	12
2	3	8	27	24	6	21	19	15	16	14	11
3	4	8	28	25	6	22	20	15	17	15	11
4	5	+7	29	26	-6	23	21	-15	18	17	-11
5	6	7	30	27	7	24	22	15	19	18	11
6	7	7	31	28	7	25	23	15	20	19	11
7	8	7	Aug. 1	29	7	26	24	15	21	20	11
8	9	+7	2	30	7	27	25	15	22	21	10
9	10	6	3	31	-7	28	26	-15	23	22	-10
10	11	6	4	31	8	29	27	15	24	23	10
11	12	6	5	Feb. 1	8	30	27	15	25	24	10
12	13	6	6	2	8	Oct. 1	28	15	26	25	10
13	14	+5	7	3	8	2	29	15	27	26	9
14	15	5	8	4	-8	3	30	-15	28	27	-9
15	16	5	9	5	9	4	31	15	29	28	9
16	17	4	10	6	9	5	Apr. 1	15	30	29	9
17	18	4	11	7	9	6	2	15	Dec. 1	30	8
18	19	+4	12	8	9	7	3	15	2	31	8
19	20	4	13	9	-9	8	4	-15	3	June 1	-8
20	21	3	14	10	10	9	5	15	4	2	8
21	22	3	15	11	10	10	6	15	5	3	7
22	23	3	16	12	10	11	7	15	6	4	7
23	24	+3	17	13	10	12	8	15	7	5	7
24	25	3	18	14	-10	13	10	-15	8	6	7
25	26	2	19	15	11	14	11	15	9	7	7
26	27	2	20	16	11	15	12	15	10	8	6
27	28	2	21	17	11	16	13	15	11	9	6
28	29	+2	22	18	11	17	14	15	12	10	6
29	30	1	23	19	-11	18	15	-15	13	11	6
30	31	1	24	20	12	19	16	15	14	12	-6
July 1	Dec. 31	1	25	21	12	20	17	15	15	13	5
2	Jan. 1	+1	26	22	12	21	18	15	16	14	5
3		0	27	23	12	22	19	15	17	15	5
4		0	28	24	-12	23	20	-15	18	16	4
5		0	29	25	12	24	21	14	19	17	-4
6		0	30	26	13	25	22	14	20	18	4
7		-1	31	27	13	26	23	14	21	19	4
8		-1	Sept. 1	28	13	27	24	14	22	20	3
9		1	2	29	-13	28	25	-14	23	21	3
10		2	3	30	13	29	26	14	24	22	3
11		2	4	31	13	30	27	14	25	23	3
12		2	5	Mar. 1	13	31	28	14	26	24	2
13		-2	6	2	13	Nov. 1	29	14	27	25	2
14		3	7	3	-14	2	30	-14	28	26	2
15		3	8	4	14	3	May 1	13	29	27	2
16		3	9	5	14	4	2	13	30	28	-2
17		3	10	6	14	5	3	13	31	29	1
18		-3	11	7	14	6	4	13	32	30	1
			12	8	-14	7	5	-13		31	-1
				9						32	0

MOONRISE, 1935

LOCAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Jan.	0	h m 1 15	h m 1 27	h m 1 41	h m 1 57	h m 2 06	h m 2 16	h m 2 29	h m 2 44	h m 2 51	h m 2 59	h m 3 08	h m 3 18	h m 3 30
	1	2 05	2 21	2 38	2 59	3 11	3 25	3 41	4 01	4 11	4 22	4 34	4 49	5 06
	2	3 01	3 20	3 41	4 05	4 19	4 35	4 55	5 20	5 32	5 46	6 02	6 21	6 45
	3	4 01	4 22	4 44	5 10	5 26	5 44	6 06	6 33	6 47	7 03	7 21	7 43	8 12
	4	5 05	5 26	5 48	6 14	6 29	6 47	7 08	7 35	7 48	8 03	8 21	8 42	9 09
	5	6 08	6 28	6 48	7 11	7 25	7 40	7 59	8 22	8 34	8 46	9 00	9 17	9 37
	6	7 10	7 25	7 42	8 01	8 12	8 24	8 39	8 57	9 05	9 15	9 25	9 37	9 51
	7	8 08	8 19	8 30	8 44	8 52	9 00	9 11	9 23	9 29	9 35	9 42	9 50	10 03
	8	9 01	9 08	9 14	9 22	9 26	9 32	9 37	9 44	9 47	9 50	9 54	9 58	10 05
	9	9 52	9 53	9 55	9 57	9 58	9 59	10 00	10 02	10 03	10 04	10 04	10 06	10 06
	10	10 41	10 37	10 34	10 30	10 28	10 25	10 22	10 19	10 17	10 16	10 14	10 12	10 09
	11	11 29	11 21	11 13	11 03	10 58	10 52	10 45	10 36	10 32	10 28	10 24	10 19	10 13
	12	12 18	12 06	11 53	11 38	11 30	11 20	11 09	10 56	10 50	10 43	10 35	10 27	10 17
	13	13 08	12 52	12 35	12 16	12 05	11 52	11 38	11 19	11 11	11 01	10 51	10 39	10 24
	14	14 00	13 41	13 21	12 58	12 45	12 30	12 11	11 49	11 38	11 26	11 12	10 56	10 37
	15	14 53	14 32	14 10	13 45	13 30	13 13	12 52	12 27	12 14	12 00	11 43	11 24	10 59
	16	15 46	15 25	15 03	14 37	14 21	14 04	13 42	13 15	13 02	12 46	12 28	12 07	11 38
	17	16 38	16 18	15 56	15 31	15 17	14 59	14 39	14 13	14 00	13 46	13 29	13 08	12 42
	18	17 28	17 10	16 51	16 28	16 15	15 59	15 41	15 18	15 07	14 54	14 40	14 23	14 02
	19	18 16	18 00	17 44	17 25	17 14	17 01	16 46	16 27	16 18	16 08	15 56	15 43	15 28
	20	19 01	18 49	18 36	18 21	18 12	18 02	17 50	17 36	17 29	17 22	17 14	17 04	16 53
	21	19 43	19 34	19 25	19 15	19 09	19 02	18 54	18 45	18 40	18 35	18 30	18 24	18 17
	22	20 24	20 19	20 14	20 08	20 05	20 02	19 57	19 52	19 50	19 47	19 44	19 41	19 37
	23	21 03	21 03	21 02	21 01	21 01	21 00	21 00	20 59	20 59	20 58	20 58	20 58	20 57
	24	21 43	21 46	21 50	21 54	21 56	21 59	22 02	22 06	22 08	22 10	22 12	22 14	22 17
	25	22 24	22 32	22 39	22 48	22 53	22 59	23 06	23 15	23 19	23 23	23 28	23 33	23 39
	26	23 08	23 19	23 31	23 45	23 53	...	...	...	...	...	...	...	...
	27	23 55	...	...	...	...	0 02	0 13	0 26	0 32	0 39	0 47	0 55	1 05
	28	...	0 10	0 26	0 43	0 55	1 07	1 22	1 40	1 49	1 58	2 09	2 22	2 36
	29	0 46	1 04	1 24	1 46	1 59	2 15	2 33	2 56	3 07	3 19	3 34	3 51	4 11
Feb.	30	1 42	2 03	2 25	2 50	3 05	3 22	3 43	4 10	4 23	4 38	4 55	5 16	5 43
	31	2 43	3 04	3 27	3 53	4 09	4 27	4 48	5 16	5 30	5 45	6 04	6 26	6 56
	1	3 46	4 06	4 28	4 52	5 07	5 24	5 45	6 10	6 22	6 36	6 53	7 12	7 36
	2	4 48	5 06	5 25	5 46	5 58	6 13	6 30	6 51	7 01	7 12	7 25	7 39	7 56
	3	5 48	6 02	6 16	6 33	6 43	6 54	7 06	7 22	7 29	7 37	7 45	7 56	8 07
	4	6 45	6 54	7 04	7 14	7 21	7 28	7 36	7 46	7 50	7 55	8 00	8 06	8 13
	5	7 39	7 43	7 47	7 52	7 55	7 58	8 01	8 05	8 07	8 09	8 12	8 14	8 17
	6	8 31	8 30	8 28	8 27	8 26	8 26	8 24	8 23	8 23	8 22	8 22	8 21	8 20
	7	9 21	9 15	9 09	9 02	8 58	8 53	8 48	8 40	8 38	8 35	8 32	8 28	8 24
	8	10 12	10 01	9 50	9 37	9 30	9 22	9 12	9 01	8 56	8 50	8 43	8 36	8 28
	9	11 03	10 48	10 33	10 15	10 05	9 53	9 40	9 23	9 16	9 07	8 58	8 47	8 34
	10	11 55	11 37	11 18	10 57	10 44	10 29	10 12	9 51	9 41	9 31	9 17	9 02	8 44
	11	12 48	12 28	12 07	11 43	11 28	11 11	10 51	10 27	10 14	10 01	9 45	9 26	9 03
	12	13 42	13 21	12 59	12 33	12 17	12 00	11 38	11 12	10 58	10 43	10 26	10 04	9 37
	13	14 34	14 14	13 52	13 26	13 11	12 54	12 33	12 06	11 53	11 38	11 21	11 00	10 33
	14	15 25	15 06	14 46	14 22	14 08	13 52	13 33	13 09	12 57	12 44	12 29	12 10	11 48
	15	16 13	15 57	15 39	15 19	15 07	14 53	14 37	14 17	14 07	13 56	13 44	13 30	13 12
	16	16 59	16 45	16 31	16 15	16 05	15 54	15 41	15 26	15 18	15 10	15 00	14 50	14 38

MOONSET, 1935

665

LOCAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date	0°	+ 10°	+ 20°	+ 30°	+ 35°	+ 40°	+ 45°	+ 50°	+ 52°	+ 54°	+ 56°	+ 58°	+ 60°
Jan. 0	13 38	13 24	13 08	12 51	12 40	12 28	12 15	11 58	11 51	11 43	11 32	11 21	11 09
1	14 31	14 13	13 54	13 32	13 19	13 05	12 48	12 26	12 16	12 04	11 51	11 36	11 18
2	15 29	15 09	14 47	14 22	14 07	13 50	13 30	13 04	12 52	12 38	12 22	12 02	11 38
3	16 31	16 10	15 47	15 21	15 05	14 47	14 26	13 58	13 44	13 29	13 11	12 48	12 19
4	17 35	17 15	16 53	16 28	16 13	15 56	15 35	15 08	14 56	14 41	14 24	14 03	13 36
5	18 38	18 21	18 02	17 40	17 28	17 13	16 55	16 33	16 22	16 10	15 56	15 40	15 20
6	19 38	19 24	19 10	18 53	18 43	18 32	18 19	18 02	17 55	17 46	17 36	17 25	17 12
7	20 34	20 25	20 15	20 04	19 58	19 51	19 42	19 32	19 27	19 22	19 16	19 09	19 02
8	21 26	21 22	21 18	21 13	21 10	21 06	21 03	20 58	20 56	20 54	20 51	20 48	20 45
9	22 15	22 16	22 17	22 18	22 19	22 20	22 21	22 22	22 22	22 22	22 23	22 23	22 24
10	23 04	23 09	23 15	23 22	23 26	23 31	23 36	23 42	23 45	23 49	23 52	23 56	...
11	23 52	...	...	...	...	...	...	...	...	...	...	...	0 01
12	...	0 02	0 13	0 25	0 33	0 41	0 50	1 02	1 08	1 14	1 20	1 28	1 37
13	0 42	0 56	1 11	1 28	1 38	1 50	2 04	2 22	2 29	2 38	2 48	2 59	3 12
14	1 33	1 50	2 09	2 30	2 43	2 58	3 15	3 37	3 47	3 59	4 12	4 28	4 47
15	2 25	2 45	3 06	3 30	3 45	4 02	4 22	4 47	5 00	5 14	5 30	5 50	6 14
16	3 18	3 39	4 02	4 28	4 43	5 01	5 22	5 49	6 02	6 18	6 36	6 58	7 26
17	4 11	4 32	4 54	5 20	5 35	5 52	6 13	6 40	6 52	7 07	7 24	7 45	8 11
18	5 03	5 22	5 43	6 06	6 20	6 36	6 55	7 19	7 30	7 43	7 58	8 16	8 37
19	5 52	6 09	6 27	6 47	6 59	7 13	7 29	7 49	7 57	8 09	8 20	8 34	8 50
20	6 38	6 52	7 06	7 23	7 33	7 44	7 57	8 12	8 20	8 27	8 36	8 46	8 58
21	7 21	7 32	7 42	7 55	8 02	8 10	8 19	8 30	8 36	8 41	8 48	8 55	9 02
22	8 03	8 09	8 16	8 24	8 28	8 33	8 39	8 46	8 49	8 53	8 56	9 01	9 05
23	8 43	8 45	8 48	8 51	8 53	8 55	8 57	9 00	9 01	9 02	9 04	9 06	9 07
24	9 22	9 21	9 20	9 18	9 17	9 16	9 15	9 14	9 13	9 12	9 11	9 10	9 09
25	10 03	9 57	9 52	9 45	9 42	9 38	9 33	9 27	9 25	9 22	9 19	9 15	9 11
26	10 45	10 36	10 26	10 15	10 08	10 01	9 53	9 43	9 38	9 33	9 27	9 21	9 14
27	11 30	11 17	11 03	10 47	10 38	10 28	10 16	10 01	9 54	9 47	9 38	9 29	9 18
28	12 19	12 02	11 45	11 25	11 13	11 00	10 44	10 25	10 16	10 05	9 54	9 41	9 25
29	13 13	12 54	12 33	12 09	11 55	11 39	11 20	10 56	10 45	10 32	10 17	10 00	9 38
30	14 11	13 50	13 28	13 02	12 46	12 28	12 07	11 40	11 27	11 12	10 55	10 33	10 07
Feb. 1	15 13	14 52	14 29	14 03	13 48	13 30	13 08	12 41	12 27	12 12	11 54	11 31	11 02
2	16 16	15 56	15 36	15 12	14 58	14 42	14 22	13 56	13 45	13 31	13 16	12 57	12 33
3	17 17	17 02	16 45	16 25	16 13	16 00	15 44	15 24	15 15	15 05	14 53	14 39	14 22
4	18 16	18 04	17 52	17 38	17 30	17 20	17 09	16 56	16 49	16 42	16 34	16 25	16 15
5	19 11	19 05	18 58	18 50	18 45	18 40	18 34	18 26	18 23	18 19	18 14	18 10	18 04
6	20 04	20 02	20 01	19 59	19 58	19 57	19 56	19 54	19 53	19 52	19 52	19 50	19 49
7	20 55	20 58	21 02	21 07	21 09	21 12	21 15	21 20	21 22	21 24	21 26	21 28	21 31
8	21 45	21 54	22 02	22 13	22 19	22 25	22 33	22 43	22 48	22 53	22 58	23 04	23 11
9	22 36	22 49	23 02	23 18	23 27	23 38	23 50	...	...	...	...	...	...
10	23 28	23 44	...	...	...	...	...	0 05	0 12	0 20	0 28	0 38	0 50
11	...	...	0 02	0 22	0 34	0 48	1 04	1 24	1 34	1 44	1 57	2 11	2 28
12	0 21	0 40	1 00	1 24	1 38	1 54	2 13	2 38	2 50	3 03	3 19	3 37	4 00
13	1 14	1 35	1 57	2 23	2 38	2 56	3 17	3 43	3 56	4 12	4 29	4 51	5 18
14	2 08	2 28	2 51	3 17	3 32	3 50	4 11	4 38	4 51	5 06	5 23	5 45	6 12
15	2 59	3 19	3 40	4 05	4 19	4 36	4 55	5 20	5 32	5 46	6 01	6 20	6 43
16	3 49	4 07	4 26	4 47	5 00	5 14	5 31	5 53	6 03	6 14	6 27	6 42	6 59
17	4 36	4 50	5 06	5 24	5 35	5 47	6 01	6 17	6 26	6 34	6 44	6 56	7 08

MOONRISE, 1935

LOCAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Feb. 15	h m 16 13	h m 15 57	h m 15 39	h m 15 19	h m 15 07	h m 14 53	h m 14 37	h m 14 17	h m 14 07	h m 13 56	h m 13 44	h m 13 30	h m 13 12
16	16 59	16 45	16 31	16 15	16 05	15 54	15 41	15 26	15 18	15 10	15 00	14 50	14 38
17	17 42	17 32	17 21	17 10	17 02	16 55	16 46	16 34	16 29	16 23	16 17	16 10	16 01
18	18 23	18 17	18 10	18 03	17 59	17 54	17 49	17 42	17 39	17 36	17 32	17 28	17 23
19	19 03	19 01	18 59	18 56	18 55	18 53	18 51	18 49	18 48	18 47	18 46	18 44	18 43
20	19 43	19 45	19 47	19 49	19 50	19 52	19 54	19 56	19 57	19 58	20 00	20 01	20 03
21	20 23	20 29	20 36	20 43	20 47	20 52	20 58	21 04	21 08	21 11	21 15	21 19	21 24
22	21 06	21 15	21 26	21 38	21 45	21 53	22 03	22 14	22 20	22 26	22 32	22 39	22 48
23	21 51	22 04	22 19	22 36	22 46	22 57	23 10	23 26	23 34	23 42	23 52	...	...
24	22 40	22 56	23 15	23 36	23 48	...	...	...	...	...	...	0 03	0 16
25	23 32	23 52	...	...	...	0 02	0 19	0 40	0 50	1 01	1 14	1 30	1 48
26	...	...	0 13	0 37	0 51	1 08	1 28	1 53	2 05	2 19	2 35	2 54	3 19
27	0 29	0 50	1 12	1 38	1 54	2 12	2 33	3 00	3 14	3 29	3 47	4 09	4 38
28	1 29	1 50	2 12	2 38	2 53	3 10	3 31	3 58	4 11	4 26	4 43	5 04	5 31
Mar. 1	2 29	2 48	3 09	3 32	3 46	4 01	4 20	4 43	4 54	5 07	5 22	5 38	5 59
2	3 29	3 45	4 02	4 21	4 32	4 45	5 00	5 18	5 26	5 36	5 47	5 59	6 13
3	4 26	4 38	4 50	5 04	5 12	5 21	5 32	5 45	5 50	5 57	6 04	6 12	6 21
4	5 22	5 28	5 35	5 43	5 48	5 53	5 59	6 06	6 10	6 13	6 17	6 22	6 26
5	6 15	6 16	6 18	6 20	6 21	6 22	6 24	6 26	6 26	6 27	6 28	6 29	6 31
6	7 07	7 03	7 00	6 56	6 53	6 51	6 48	6 44	6 42	6 41	6 39	6 37	6 34
7	7 59	7 50	7 42	7 32	7 26	7 20	7 12	7 04	6 59	6 55	6 50	6 45	6 39
8	8 51	8 39	8 25	8 10	8 01	7 51	7 39	7 25	7 19	7 12	7 04	6 55	6 44
9	9 45	9 29	9 11	8 52	8 40	8 26	8 11	7 52	7 43	7 33	7 22	7 08	6 54
10	10 40	10 21	10 01	9 37	9 23	9 07	8 49	8 25	8 14	8 01	7 47	7 30	7 09
11	11 35	11 15	10 52	10 27	10 12	9 55	9 34	9 08	8 55	8 40	8 23	8 03	7 37
12	12 29	12 08	11 46	11 20	11 05	10 48	10 27	10 00	9 47	9 32	9 14	8 53	8 26
13	13 21	13 01	12 40	12 16	12 02	11 46	11 26	11 01	10 49	10 35	10 19	10 00	9 36
14	14 10	13 53	13 34	13 13	13 00	12 46	12 28	12 07	11 57	11 45	11 32	11 16	10 58
15	14 56	14 42	14 26	14 09	13 59	13 47	13 33	13 16	13 07	12 58	12 48	12 36	12 23
16	15 40	15 29	15 17	15 04	14 56	14 47	14 37	14 24	14 18	14 12	14 04	13 56	13 47
17	16 22	16 14	16 07	15 58	15 53	15 47	15 40	15 32	15 28	15 24	15 20	15 14	15 08
18	17 02	16 59	16 55	16 51	16 48	16 46	16 43	16 39	16 37	16 36	16 33	16 31	16 29
19	17 42	17 43	17 43	17 44	17 45	17 45	17 46	17 46	17 47	17 47	17 48	17 48	17 49
20	18 23	18 27	18 32	18 38	18 41	18 45	18 49	18 54	18 57	19 00	19 02	19 06	19 10
21	19 05	19 13	19 22	19 33	19 39	19 46	19 54	20 04	20 09	20 14	20 20	20 26	20 33
22	19 49	20 02	20 15	20 30	20 39	20 49	21 01	21 16	21 23	21 30	21 39	21 49	22 00
23	20 37	20 53	21 10	21 29	21 41	21 54	22 10	22 29	22 38	22 49	23 00	23 14	23 30
24	21 28	21 47	22 07	22 30	22 44	22 59	23 18	23 42	23 53	...	...	...	...
25	22 23	22 44	23 05	23 31	23 46	...	...	...	...	0 06	0 21	0 39	1 01
26	23 20	23 41	...	...	...	0 03	0 24	0 50	1 03	1 18	1 35	1 56	2 23
27	...	...	0 04	0 29	0 44	1 02	1 23	1 50	2 03	2 18	2 36	2 57	3 24
28	0 19	0 39	0 59	1 24	1 38	1 54	2 14	2 38	2 50	3 03	3 19	3 37	4 00
29	1 17	1 34	1 52	2 13	2 25	2 39	2 55	3 16	3 25	3 36	3 48	4 02	4 18
30	2 13	2 26	2 40	2 57	3 06	3 17	3 29	3 44	3 51	3 59	4 08	4 18	4 28
31	3 07	3 16	3 26	3 36	3 43	3 50	3 58	4 08	4 12	4 17	4 22	4 28	4 35
Apr. 1	4 00	4 04	4 08	4 13	4 16	4 19	4 23	4 28	4 30	4 32	4 34	4 37	4 40
2	4 51	4 50	4 50	4 49	4 48	4 48	4 47	4 46	4 46	4 45	4 45	4 44	4 44

MOONSET, 1935

667

LOCAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.

For other longitudes and for southern latitudes see page 680.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Feb. 15	h m 3 49	h m 4 07	h m 4 26	h m 4 47	h m 5 00	h m 5 14	h m 5 31	h m 5 53	h m 6 03	h m 6 14	h m 6 27	h m 6 42	h m 6 59
16	4 36	4 50	5 06	5 24	5 35	5 47	6 01	6 17	6 26	6 34	6 44	6 56	7 08
17	5 20	5 31	5 43	5 57	6 05	6 14	6 25	6 37	6 43	6 50	6 57	7 05	7 14
18	6 02	6 09	6 18	6 27	6 32	6 38	6 45	6 54	6 58	7 02	7 06	7 12	7 17
19	6 42	6 46	6 50	6 55	6 58	7 01	7 04	7 08	7 10	7 12	7 14	7 17	7 20
20	7 22	7 22	7 22	7 22	7 22	7 22	7 22	7 22	7 22	7 22	7 22	7 22	7 22
21	8 02	7 58	7 54	7 49	7 46	7 43	7 40	7 36	7 34	7 32	7 29	7 26	7 24
22	8 43	8 36	8 27	8 18	8 12	8 06	7 59	7 50	7 46	7 42	7 37	7 32	7 26
23	9 27	9 15	9 03	8 49	8 41	8 31	8 21	8 08	8 02	7 55	7 48	7 39	7 30
24	10 14	9 58	9 42	9 24	9 13	9 00	8 46	8 29	8 20	8 11	8 01	7 49	7 36
25	11 04	10 46	10 27	10 04	9 51	9 36	9 19	8 57	8 46	8 34	8 21	8 05	7 46
26	11 59	11 39	11 17	10 52	10 37	10 20	10 00	9 34	9 22	9 09	8 51	8 31	8 07
27	12 57	12 36	12 14	11 48	11 32	11 14	10 52	10 25	10 12	9 56	9 38	9 15	8 46
28	13 58	13 38	13 16	12 51	12 36	12 19	11 58	11 32	11 19	11 04	10 47	10 27	10 00
Mar. 1	14 58	14 40	14 21	13 59	13 46	13 32	13 14	12 51	12 41	12 28	12 15	11 58	11 38
2	15 57	15 43	15 28	15 11	15 01	14 49	14 36	14 19	14 11	14 02	13 52	13 40	13 27
3	16 53	16 44	16 34	16 22	16 16	16 08	15 59	15 48	15 43	15 38	15 32	15 25	15 17
4	17 47	17 43	17 38	17 33	17 30	17 26	17 22	17 18	17 15	17 13	17 10	17 07	17 04
5	18 39	18 40	18 41	18 43	18 44	18 44	18 44	18 46	18 46	18 46	18 47	18 48	18 48
6	19 31	19 37	19 44	19 51	19 55	20 00	20 06	20 12	20 15	20 19	20 23	20 27	20 31
7	20 24	20 34	20 46	20 59	21 06	21 15	21 25	21 38	21 43	21 50	21 57	22 05	22 14
8	21 17	21 32	21 48	22 06	22 16	22 29	22 43	23 01	23 10	23 19	23 30	23 42	23 56
9	22 11	22 29	22 49	23 11	23 24	23 40	23 58	...	...	...	...	...	...
10	23 07	23 27	23 48	...	...	...	...	0 20	0 31	0 43	0 57	1 14	1 34
11	...	...	...	0 13	0 28	0 45	1 06	1 31	1 44	1 58	2 15	2 35	3 00
12	0 01	0 22	0 44	1 10	1 25	1 43	2 04	2 31	2 44	2 59	3 17	3 38	4 05
13	0 54	1 14	1 36	2 01	2 16	2 33	2 53	3 18	3 30	3 45	4 01	4 20	4 44
14	1 45	2 03	2 23	2 46	2 59	3 14	3 32	3 54	4 05	4 17	4 30	4 47	5 06
15	2 33	2 48	3 05	3 24	3 36	3 48	4 03	4 22	4 30	4 40	4 51	5 03	5 17
16	3 18	3 30	3 44	3 59	4 07	4 17	4 29	4 43	4 50	4 57	5 05	5 14	5 24
17	4 00	4 09	4 19	4 30	4 36	4 42	4 51	5 01	5 05	5 10	5 16	5 22	5 28
18	4 41	4 46	4 52	4 58	5 02	5 06	5 10	5 16	5 18	5 21	5 24	5 28	5 31
19	5 21	5 22	5 24	5 25	5 26	5 27	5 29	5 30	5 31	5 31	5 32	5 33	5 34
20	6 01	5 59	5 56	5 53	5 51	5 49	5 47	5 44	5 42	5 41	5 40	5 38	5 36
21	6 43	6 36	6 29	6 21	6 17	6 12	6 06	5 59	5 55	5 52	5 48	5 43	5 39
22	7 26	7 15	7 04	6 52	6 45	6 36	6 27	6 15	6 10	6 04	5 58	5 50	5 42
23	8 12	7 58	7 43	7 26	7 16	7 05	6 52	6 35	6 28	6 20	6 10	6 00	5 48
24	9 01	8 44	8 26	8 05	7 52	7 38	7 22	7 01	6 51	6 41	6 28	6 14	5 57
25	9 54	9 35	9 14	8 50	8 36	8 19	8 00	7 35	7 24	7 10	6 55	6 37	6 14
26	10 50	10 30	10 08	9 42	9 27	9 09	8 48	8 21	8 08	7 53	7 36	7 14	6 48
27	11 48	11 28	11 06	10 41	10 26	10 08	9 47	9 21	9 08	8 53	8 35	8 14	7 47
28	12 47	12 28	12 08	11 45	11 32	11 16	10 57	10 33	10 22	10 09	9 54	9 36	9 14
29	13 44	13 29	13 12	12 53	12 42	12 29	12 14	11 54	11 45	11 35	11 24	11 11	10 55
30	14 39	14 28	14 16	14 02	13 54	13 44	13 33	13 20	13 14	13 07	12 59	12 50	12 40
31	15 32	15 26	15 18	15 11	15 06	15 00	14 54	14 46	14 43	14 39	14 34	14 30	14 24
Apr. 1	16 24	16 22	16 21	16 19	16 17	16 16	16 14	16 12	16 11	16 10	16 09	16 08	16 07
2	17 16	17 19	17 23	17 26	17 29	17 32	17 35	17 38	17 40	17 42	17 44	17 46	17 49

MOONRISE, 1935

LOCAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Apr.	1	4 00	4 04	4 08	4 13	4 16	4 19	4 23	4 28	4 30	4 32	4 34	4 37	4 40
	2	4 51	4 50	4 50	4 49	4 48	4 48	4 47	4 46	4 46	4 45	4 45	4 44	4 44
	3	5 43	5 37	5 31	5 24	5 20	5 16	5 11	5 05	5 02	4 59	4 56	4 52	4 48
	4	6 36	6 25	6 14	6 02	5 55	5 47	5 37	5 26	5 21	5 15	5 09	5 02	4 54
	5	7 30	7 16	7 00	6 42	6 32	6 21	6 07	5 51	5 43	5 34	5 25	5 14	5 02
	6	8 26	8 08	7 49	7 27	7 14	7 00	6 43	6 21	6 12	6 00	5 47	5 32	5 15
	7	9 22	9 03	8 41	8 17	8 02	7 46	7 26	7 01	6 49	6 35	6 20	6 01	5 38
	8	10 19	9 58	9 36	9 10	8 55	8 38	8 17	7 50	7 38	7 23	7 06	6 45	6 18
	9	11 13	10 53	10 32	10 07	9 52	9 35	9 15	8 50	8 37	8 23	8 06	7 47	7 22
	10	12 04	11 46	11 27	11 04	10 51	10 36	10 18	9 55	9 44	9 32	9 18	9 01	8 41
	11	12 52	12 36	12 20	12 01	11 50	11 37	11 22	11 04	10 55	10 45	10 34	10 21	10 06
	12	13 36	13 24	13 12	12 57	12 48	12 38	12 27	12 13	12 06	11 59	11 50	11 41	11 30
	13	14 19	14 10	14 01	13 51	13 45	13 38	13 30	13 21	13 16	13 11	13 06	13 00	12 52
	14	15 00	14 55	14 50	14 44	14 41	14 37	14 33	14 28	14 25	14 23	14 20	14 16	14 13
	15	15 40	15 39	15 38	15 37	15 36	15 36	15 35	15 35	15 34	15 34	15 33	15 33	15 32
	16	16 20	16 23	16 27	16 31	16 33	16 36	16 39	16 42	16 44	16 46	16 48	16 50	16 53
	17	17 02	17 09	17 17	17 26	17 31	17 36	17 43	17 52	17 56	18 00	18 04	18 10	18 15
	18	17 46	17 57	18 09	18 23	18 30	18 40	18 50	19 03	19 09	19 16	19 24	19 32	19 42
	19	18 34	18 48	19 04	19 22	19 32	19 45	19 59	20 17	20 25	20 34	20 45	20 57	21 12
	20	19 24	19 42	20 01	20 23	20 36	20 51	21 08	21 31	21 41	21 54	22 07	22 24	22 43
	21	20 19	20 39	21 00	21 24	21 39	21 56	22 16	22 42	22 54	23 08	23 25	23 45	...
	22	21 16	21 36	21 58	22 24	22 39	22 57	23 18	23 44	23 57	...	...	...	0 10
	23	22 14	22 34	22 55	23 20	23 34	23 51	...	...	...	0 12	0 30	0 51	1 18
	24	23 11	23 29	23 48	...	...	...	0 11	0 36	0 48	1 02	1 18	1 36	2 00
	25	...	...	...	0 10	0 22	0 37	0 54	1 16	1 26	1 37	1 50	2 05	2 23
	26	0 07	0 21	0 37	0 54	1 05	1 16	1 30	1 46	1 54	2 02	2 12	2 23	2 35
	27	1 00	1 11	1 22	1 34	1 41	1 50	1 59	2 10	2 16	2 22	2 28	2 35	2 43
	28	1 52	1 57	2 04	2 11	2 15	2 19	2 25	2 31	2 34	2 37	2 40	2 44	2 49
	29	2 42	2 43	2 44	2 45	2 46	2 47	2 48	2 50	2 50	2 51	2 52	2 52	2 53
	30	3 32	3 28	3 24	3 20	3 17	3 15	3 12	3 08	3 06	3 04	3 02	3 00	2 58
May	1	4 23	4 14	4 06	3 56	3 50	3 44	3 36	3 28	3 23	3 19	3 14	3 09	3 03
	2	5 15	5 03	4 49	4 34	4 26	4 16	4 04	3 50	3 44	3 36	3 29	3 20	3 10
	3	6 10	5 54	5 37	5 17	5 06	4 52	4 37	4 18	4 09	3 59	3 48	3 35	3 20
	4	7 07	6 48	6 28	6 05	5 51	5 35	5 17	4 54	4 43	4 30	4 16	3 59	3 39
	5	8 04	7 44	7 22	6 57	6 43	6 25	6 05	5 39	5 27	5 13	4 56	4 36	4 12
	6	9 01	8 41	8 19	7 54	7 39	7 22	7 01	6 36	6 23	6 08	5 52	5 32	5 06
	7	9 54	9 35	9 15	8 52	8 38	8 22	8 04	7 40	7 28	7 15	7 01	6 43	6 21
	8	10 44	10 28	10 10	9 50	9 38	9 25	9 09	8 49	8 39	8 28	8 16	8 02	7 45
	9	11 31	11 17	11 03	10 47	10 38	10 27	10 14	9 58	9 51	9 43	9 34	9 23	9 11
	10	12 14	12 04	11 54	11 42	11 35	11 27	11 18	11 07	11 02	10 56	10 50	10 42	10 34
	11	12 56	12 50	12 43	12 36	12 32	12 27	12 21	12 14	12 11	12 08	12 04	12 00	11 55
	12	13 36	13 34	13 31	13 29	13 27	13 26	13 24	13 21	13 20	13 19	13 18	13 16	13 14
	13	14 16	14 18	14 20	14 22	14 23	14 24	14 26	14 28	14 29	14 30	14 31	14 32	14 34
	14	14 57	15 03	15 09	15 16	15 20	15 24	15 30	15 36	15 39	15 43	15 46	15 50	15 55
	15	15 40	15 50	16 00	16 12	16 19	16 27	16 36	16 47	16 52	16 58	17 04	17 11	17 20
	16	16 27	16 40	16 54	17 10	17 20	17 31	17 44	18 00	18 07	18 16	18 25	18 36	18 48
	17	17 17	17 33	17 51	18 12	18 24	18 38	18 54	19 15	19 24	19 36	19 48	20 03	20 20
	18	18 11	18 30	18 50	19 14	19 28	19 44	20 04	20 28	20 40	20 54	21 09	21 28	21 51

MOONSET, 1935

669

LOCAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Apr. 1	16 24	16 22	16 21	16 19	16 17	16 16	16 14	16 12	16 11	16 10	16 09	16 08	16 07
2	17 16	17 19	17 23	17 26	17 29	17 32	17 35	17 38	17 40	17 42	17 44	17 46	17 49
3	18 08	18 16	18 25	18 35	18 40	18 47	18 55	19 04	19 09	19 14	19 19	19 25	19 31
4	19 01	19 14	19 28	19 43	19 52	20 03	20 15	20 30	20 37	20 45	20 53	21 04	21 15
5	19 57	20 13	20 30	20 51	21 03	21 16	21 33	21 53	22 03	22 14	22 26	22 40	22 57
6	20 53	21 12	21 33	21 56	22 10	22 27	22 46	23 10	23 22	23 36	23 51	...	...
7	21 50	22 10	22 32	22 57	23 13	23 30	23 51	...	...	...	...	0 09	0 32
8	22 45	23 05	23 27	23 52	...	...	...	0 18	0 30	0 45	1 02	1 23	1 49
9	23 38	23 57	...	...	0 07	0 24	0 45	1 11	1 23	1 38	1 54	2 14	2 40
10	...	...	0 17	0 40	0 54	1 10	1 29	1 52	2 03	2 16	2 30	2 47	3 08
11	0 27	0 44	1 02	1 22	1 34	1 47	2 03	2 23	2 32	2 42	2 54	3 08	3 23
12	1 14	1 27	1 42	1 58	2 08	2 19	2 31	2 47	2 54	3 02	3 11	3 21	3 32
13	1 57	2 07	2 18	2 30	2 37	2 45	2 55	3 06	3 11	3 17	3 23	3 30	3 38
14	2 38	2 45	2 52	3 00	3 04	3 09	3 15	3 22	3 25	3 29	3 32	3 37	3 41
15	3 19	3 22	3 24	3 28	3 30	3 31	3 34	3 36	3 38	3 39	3 41	3 42	3 44
16	3 59	3 58	3 56	3 55	3 54	3 53	3 52	3 51	3 50	3 49	3 49	3 48	3 47
17	4 40	4 35	4 29	4 23	4 20	4 16	4 11	4 05	4 03	4 00	3 57	3 54	3 50
18	5 23	5 14	5 04	4 53	4 47	4 40	4 32	4 22	4 17	4 12	4 06	4 00	3 53
19	6 08	5 56	5 42	5 27	5 18	5 07	4 56	4 41	4 34	4 27	4 19	4 09	3 59
20	6 57	6 41	6 24	6 04	5 53	5 40	5 24	5 05	4 57	4 46	4 35	4 23	4 08
21	7 50	7 31	7 11	6 48	6 34	6 19	6 00	5 38	5 26	5 14	5 00	4 43	4 23
22	8 46	8 26	8 04	7 39	7 24	7 07	6 46	6 20	6 08	5 53	5 37	5 16	4 51
23	9 44	9 23	9 01	8 36	8 21	8 02	7 42	7 16	7 03	6 48	6 31	6 10	5 43
24	10 42	10 23	10 02	9 39	9 25	9 08	8 49	8 24	8 13	7 59	7 44	7 25	7 02
25	11 38	11 22	11 04	10 44	10 32	10 19	10 02	9 42	9 32	9 22	9 09	8 55	8 38
26	12 33	12 20	12 07	11 51	11 42	11 32	11 19	11 04	10 57	10 49	10 40	10 30	10 19
27	13 25	13 16	13 08	12 58	12 52	12 45	12 37	12 27	12 23	12 18	12 12	12 06	11 59
28	14 15	14 12	14 08	14 04	14 01	13 58	13 54	13 50	13 49	13 46	13 44	13 42	13 39
29	15 05	15 06	15 08	15 09	15 10	15 11	15 12	15 13	15 14	15 15	15 15	15 16	15 17
30	15 56	16 02	16 08	16 15	16 20	16 24	16 30	16 37	16 40	16 44	16 47	16 51	16 56
May 1	16 47	16 58	17 09	17 22	17 30	17 38	17 48	18 01	18 07	18 13	18 20	18 28	18 37
2	17 41	17 56	18 12	18 30	18 40	18 52	19 07	19 24	19 33	19 42	19 53	20 05	20 19
3	18 37	18 55	19 14	19 36	19 50	20 05	20 23	20 45	20 56	21 08	21 22	21 38	21 58
4	19 35	19 55	20 16	20 40	20 55	21 12	21 32	21 58	22 10	22 24	22 40	23 00	23 25
5	20 32	20 52	21 14	21 39	21 54	22 12	22 32	22 58	23 11	23 26	23 42	...	...
6	21 27	21 46	22 07	22 31	22 45	23 02	23 21	23 45	23 57	...	...	0 03	0 28
7	22 19	22 36	22 55	23 16	23 29	23 43	...	...	...	0 10	0 26	0 43	1 05
8	23 07	23 22	23 37	23 55	...	...	0 00	0 21	0 31	0 42	0 54	1 09	1 26
9	23 52	...	...	...	0 06	0 17	0 31	0 48	0 56	1 05	1 14	1 25	1 38
10	...	0 03	0 15	0 29	0 37	0 46	0 57	1 09	1 15	1 21	1 28	1 36	1 45
11	0 34	0 42	0 50	1 00	1 05	1 11	1 18	1 26	1 30	1 35	1 39	1 44	1 50
12	1 15	1 19	1 23	1 28	1 31	1 34	1 38	1 42	1 44	1 46	1 48	1 51	1 54
13	1 55	1 55	1 56	1 56	1 56	1 56	1 56	1 56	1 56	1 57	1 57	1 57	1 57
14	2 36	2 32	2 28	2 23	2 21	2 18	2 15	2 11	2 09	2 07	2 06	2 02	2 00
15	3 18	3 10	3 02	2 53	2 48	2 42	2 34	2 26	2 23	2 18	2 14	2 09	2 03
16	4 02	3 51	3 39	3 25	3 17	3 08	2 57	2 45	2 39	2 32	2 25	2 17	2 08
17	4 50	4 35	4 19	4 01	3 51	3 39	3 24	3 06	2 59	2 50	2 40	2 29	2 16
18	5 42	5 24	5 05	4 43	4 30	4 16	3 58	3 37	3 27	3 15	3 02	2 47	2 29

MOONRISE, 1935

LOCAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
May	17	17 17	17 33	17 51	18 12	18 24	18 38	18 54	19 15	19 24	19 36	19 48	20 03
	18	18 11	18 30	18 50	19 14	19 28	19 44	20 04	20 28	20 40	20 54	21 09	21 28
	19	19 08	19 28	19 50	20 16	20 31	20 48	21 09	21 35	21 48	22 03	22 20	22 41
	20	20 07	20 28	20 49	21 14	21 29	21 46	22 06	22 32	22 44	22 58	23 15	23 34
	21	21 06	21 24	21 44	22 07	22 20	22 35	22 53	23 16	23 26	23 38	23 52	...
	22	22 03	22 18	22 35	22 53	23 04	23 17	23 31	23 49	23 58	...	...	0 08
	23	22 57	23 08	23 21	23 34	23 43	23 52	...	...	...	0 07	0 17	0 29
	24	23 48	23 56	...	...	...	...	0 02	0 15	0 21	0 27	0 35	0 43
	25	...	...	0 03	0 12	0 16	0 22	0 29	0 36	0 40	0 44	0 48	0 53
	26	0 38	0 40	0 43	0 46	0 48	0 50	0 52	0 55	0 56	0 58	0 59	1 01
	27	1 26	1 24	1 22	1 20	1 18	1 17	1 15	1 13	1 12	1 11	1 10	1 08
	28	2 16	2 09	2 02	1 54	1 49	1 44	1 38	1 31	1 28	1 25	1 21	1 16
	29	3 06	2 55	2 44	2 30	2 23	2 14	2 04	1 52	1 47	1 40	1 34	1 26
	30	3 59	3 44	3 29	3 11	3 00	2 48	2 34	2 17	2 10	2 01	1 51	1 40
	31	4 54	4 36	4 17	3 55	3 42	3 28	3 10	2 49	2 39	2 27	2 14	1 59
June	1	5 51	5 31	5 10	4 46	4 31	4 15	3 55	3 30	3 18	3 05	2 49	2 30
	2	6 48	6 28	6 06	5 40	5 26	5 08	4 48	4 22	4 09	3 55	3 38	3 18
	3	7 43	7 24	7 03	6 39	6 24	6 08	5 48	5 24	5 12	4 58	4 42	4 23
	4	8 35	8 17	7 59	7 38	7 25	7 10	6 53	6 31	6 21	6 10	5 56	5 41
	5	9 23	9 09	8 53	8 36	8 25	8 13	7 59	7 42	7 34	7 24	7 14	7 02
	6	10 08	9 57	9 45	9 32	9 24	9 15	9 04	8 52	8 46	8 39	8 32	8 23
	7	10 51	10 43	10 35	10 26	10 21	10 15	10 08	10 00	9 56	9 52	9 47	9 42
	8	11 31	11 28	11 24	11 20	11 17	11 14	11 11	11 07	11 05	11 03	11 01	10 58
	9	12 11	12 12	12 12	12 12	12 12	12 12	12 13	12 13	12 13	12 14	12 14	12 14
	10	12 52	12 56	13 00	13 05	13 08	13 11	13 16	13 20	13 22	13 25	13 27	13 30
	11	13 33	13 41	13 50	14 00	14 06	14 12	14 20	14 29	14 33	14 38	14 43	14 49
	12	14 18	14 30	14 42	14 57	15 05	15 15	15 26	15 40	15 47	15 54	16 02	16 11
	13	15 06	15 21	15 38	15 57	16 08	16 20	16 36	16 54	17 03	17 13	17 24	17 37
	14	15 58	16 16	16 36	16 59	17 12	17 27	17 46	18 09	18 20	18 32	18 47	19 04
	15	16 55	17 15	17 36	18 01	18 16	18 33	18 54	19 20	19 32	19 46	20 03	20 24
	16	17 55	18 15	18 37	19 02	19 18	19 35	19 56	20 22	20 35	20 49	21 06	21 28
	17	18 55	19 14	19 35	19 59	20 12	20 29	20 48	21 11	21 23	21 36	21 51	22 08
	18	19 55	20 11	20 29	20 49	21 01	21 14	21 30	21 50	21 59	22 09	22 20	22 34
	19	20 51	21 04	21 18	21 33	21 42	21 52	22 04	22 18	22 25	22 32	22 40	22 50
	20	21 45	21 53	22 02	22 12	22 18	22 25	22 32	22 42	22 46	22 50	22 55	23 01
July	21	22 35	22 39	22 43	22 48	22 51	22 54	22 57	23 01	23 03	23 05	23 07	23 10
	22	23 24	23 24	23 23	23 22	23 21	23 21	23 20	23 19	23 19	23 18	23 18	23 18
	23	...	...	...	23 56	23 52	23 48	23 43	23 37	23 35	23 32	23 29	23 25
	24	0 13	0 08	0 02	...	...	...	...	23 57	23 52	23 47	23 41	23 34
	25	1 03	0 53	0 43	0 31	0 24	0 17	0 08	...	...	...	23 56	23 46
	26	1 54	1 40	1 26	1 09	0 59	0 48	0 36	0 20	0 13	0 05	...	...
	27	2 47	2 30	2 12	1 51	1 39	1 25	1 09	0 49	0 40	0 29	0 17	0 03
	28	3 42	3 23	3 03	2 39	2 25	2 09	1 50	1 26	1 14	1 01	0 47	0 29
	29	4 38	4 18	3 56	3 31	3 16	2 59	2 39	2 13	2 00	1 46	1 29	1 09
	30	5 34	5 14	4 52	4 28	4 13	3 56	3 36	3 10	2 58	2 44	2 28	2 08
July	1	6 26	6 08	5 49	5 26	5 13	4 57	4 39	4 16	4 05	3 53	3 38	3 21
	2	7 16	7 01	6 44	6 25	6 13	6 00	5 45	5 26	5 17	5 07	4 55	4 42

MOONSET, 1935

671

LOCAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date		0°	+ 10°	+ 20°	+ 30°	+ 35°	+ 40°	+ 45°	+ 50°	+ 52°	+ 54°	+ 56°	+ 58°	+ 60°
May	17	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
	18	4 50	4 35	4 19	4 01	3 51	3 39	3 24	3 06	2 59	2 50	2 40	2 29	2 16
	19	5 42	5 24	5 05	4 43	4 30	4 16	3 58	3 37	3 27	3 15	3 02	2 47	2 29
	20	6 38	6 18	5 57	5 32	5 18	5 01	4 42	4 16	4 04	3 51	3 35	3 16	2 53
	21	7 36	7 16	6 54	6 29	6 14	5 56	5 35	5 09	4 56	4 41	4 24	4 03	3 37
	22	8 36	8 16	7 55	7 31	7 17	7 00	6 40	6 15	6 03	5 49	5 33	5 13	4 50
	23	9 34	9 17	8 58	8 37	8 24	8 10	7 53	7 32	7 21	7 10	6 56	6 41	6 23
	24	10 29	10 16	10 01	9 44	9 34	9 23	9 10	8 53	8 46	8 37	8 27	8 16	8 03
	25	11 22	11 12	11 02	10 51	10 44	10 36	10 27	10 16	10 11	10 06	9 59	9 52	9 44
	26	12 12	12 07	12 02	11 56	11 52	11 48	11 44	11 38	11 36	11 33	11 30	11 26	11 22
	27	13 01	13 01	13 01	13 00	13 00	13 00	13 00	12 59	12 59	12 59	12 59	12 58	12 58
	28	13 50	13 54	13 59	14 04	14 08	14 11	14 15	14 20	14 22	14 25	14 28	14 31	14 34
	29	14 40	14 49	14 58	15 09	15 15	15 23	15 31	15 41	15 46	15 52	15 57	16 04	16 12
	30	15 31	15 44	15 58	16 14	16 24	16 35	16 48	17 03	17 10	17 19	17 28	17 38	17 50
	31	16 25	16 42	17 00	17 20	17 33	17 46	18 03	18 23	18 33	18 44	18 57	19 12	19 29
June	1	17 22	17 41	18 01	18 25	18 39	18 55	19 14	19 39	19 50	20 04	20 19	20 38	21 00
	2	18 19	18 39	19 01	19 26	19 41	19 58	20 18	20 45	20 57	21 12	21 28	21 49	22 14
	3	19 15	19 35	19 56	20 21	20 35	20 52	21 12	21 37	21 49	22 03	22 19	22 38	23 02
	4	20 08	20 27	20 46	21 09	21 22	21 37	21 55	22 18	22 28	22 40	22 54	23 10	23 29
	5	20 59	21 14	21 31	21 51	22 02	22 15	22 30	22 48	22 57	23 07	23 18	23 30	23 44
	6	21 45	21 58	22 12	22 27	22 36	22 46	22 58	23 12	23 18	23 26	23 34	23 43	23 53
	7	22 29	22 38	22 48	22 59	23 05	23 12	23 21	23 31	23 35	23 40	23 46	23 52	23 59
	8	23 10	23 16	23 22	23 28	23 32	23 36	23 41	23 47	23 49	23 52	23 55	23 59	...
	9	23 50	23 52	23 54	23 56	23 57	23 58	...	...	...	...	...	...	0 03
	10	...	...	...	...	...	...	0 00	0 02	0 02	0 03	0 04	0 05	0 06
	11	0 30	0 28	0 26	0 23	0 22	0 20	0 18	0 16	0 15	0 14	0 12	0 11	0 09
	12	1 11	1 05	0 59	0 52	0 47	0 43	0 37	0 31	0 28	0 24	0 21	0 17	0 12
	13	1 54	1 45	1 34	1 22	1 15	1 07	0 58	0 48	0 42	0 37	0 31	0 24	0 17
	14	2 40	2 27	2 13	1 56	1 47	1 36	1 23	1 08	1 01	0 53	0 44	0 34	0 23
	15	3 31	3 14	2 56	2 36	2 24	2 10	1 54	1 34	1 25	1 14	1 03	0 49	0 33
	16	4 25	4 06	3 46	3 22	3 08	2 52	2 33	2 09	1 58	1 45	1 30	1 13	0 52
	17	5 23	5 03	4 41	4 16	4 01	3 44	3 23	2 57	2 44	2 30	2 12	1 52	1 26
	18	6 24	6 04	5 42	5 17	5 03	4 45	4 25	3 59	3 46	3 32	3 15	2 55	2 29
	19	7 24	7 06	6 46	6 24	6 11	5 55	5 37	5 14	5 03	4 50	4 36	4 19	3 58
	20	8 22	8 07	7 51	7 33	7 22	7 09	6 55	6 36	6 28	6 18	6 07	5 55	5 40
	21	9 17	9 06	8 55	8 41	8 34	8 25	8 14	8 02	7 56	7 49	7 42	7 33	7 24
	22	10 09	10 03	9 56	9 48	9 44	9 39	9 33	9 26	9 22	9 19	9 15	9 10	9 05
	23	10 59	10 57	10 56	10 54	10 53	10 51	10 50	10 48	10 47	10 46	10 45	10 44	10 43
	24	11 48	11 51	11 54	11 58	12 00	12 03	12 06	12 09	12 10	12 12	12 14	12 16	12 19
	25	12 37	12 44	12 52	13 02	13 08	13 13	13 21	13 29	13 34	13 38	13 43	13 48	13 55
	26	13 27	13 39	13 52	14 06	14 15	14 25	14 36	14 50	14 57	15 04	15 12	15 21	15 32
	27	14 19	14 35	14 52	15 11	15 22	15 35	15 50	16 09	16 18	16 28	16 40	16 53	17 09
	28	15 14	15 32	15 52	16 15	16 28	16 44	17 02	17 25	17 36	17 49	18 04	18 21	18 42
	29	16 09	16 29	16 51	17 16	17 30	17 47	18 08	18 34	18 46	19 00	19 17	19 37	20 02
	30	17 05	17 26	17 47	18 12	18 27	18 44	19 05	19 31	19 43	19 57	20 14	20 34	20 59
	31	18 00	18 19	18 39	19 03	19 16	19 32	19 52	20 15	20 26	20 39	20 54	21 11	21 32
July	1	18 51	19 08	19 26	19 47	19 59	20 13	20 29	20 49	20 58	21 09	21 21	21 35	21 51
	2	19 39	19 53	20 08	20 25	20 35	20 46	20 59	21 15	21 22	21 30	21 40	21 50	22 01

MOONRISE, 1935

LOCAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
July	1	h m 6 26	h m 6 08	h m 5 49	h m 5 26	h m 5 13	h m 4 57	h m 4 39	h m 4 16	h m 4 05	h m 3 53	h m 3 38	h m 3 21	h m 3 00
	2	7 16	7 01	6 44	6 25	6 13	6 00	5 45	5 26	5 17	5 07	4 55	4 42	4 26
	3	8 03	7 50	7 37	7 22	7 13	7 03	6 51	6 36	6 30	6 22	6 13	6 04	5 53
	4	8 46	8 38	8 28	8 17	8 11	8 04	7 56	7 45	7 40	7 36	7 30	7 23	7 16
	5	9 28	9 23	9 17	9 11	9 07	9 04	8 59	8 53	8 50	8 48	8 44	8 41	8 37
	6	10 08	10 06	10 05	10 04	10 03	10 02	10 01	9 59	9 59	9 58	9 57	9 57	9 56
	7	10 47	10 50	10 53	10 56	10 58	11 00	11 03	11 06	11 07	11 08	11 10	11 12	11 14
	8	11 28	11 34	11 41	11 49	11 54	11 59	12 06	12 13	12 16	12 20	12 24	12 29	12 34
	9	12 10	12 21	12 32	12 44	12 52	13 00	13 10	13 22	13 28	13 34	13 41	13 48	13 57
	10	12 56	13 10	13 25	13 42	13 52	14 03	14 17	14 34	14 41	14 50	15 00	15 11	15 24
	11	13 46	14 03	14 21	14 42	14 54	15 09	15 26	15 47	15 57	16 08	16 21	16 36	16 55
	12	14 40	14 59	15 20	15 44	15 58	16 14	16 34	16 59	17 11	17 25	17 40	18 00	18 23
	13	15 38	15 58	16 20	16 46	17 00	17 18	17 39	18 05	18 18	18 33	18 50	19 11	19 38
	14	16 38	16 58	17 20	17 44	17 59	18 16	18 36	19 02	19 14	19 27	19 44	20 03	20 27
	15	17 39	17 57	18 16	18 38	18 51	19 06	19 23	19 45	19 55	20 07	20 20	20 35	20 53
	16	18 38	18 53	19 08	19 26	19 36	19 48	20 02	20 18	20 26	20 35	20 45	20 56	21 08
	17	19 35	19 45	19 56	20 09	20 16	20 24	20 33	20 45	20 50	20 56	21 02	21 09	21 17
	18	20 28	20 34	20 40	20 47	20 50	20 55	21 00	21 06	21 09	21 12	21 15	21 19	21 23
	19	21 20	21 20	21 21	21 22	21 23	21 24	21 24	21 25	21 26	21 26	21 27	21 27	21 28
	20	22 10	22 06	22 02	21 57	21 54	21 51	21 48	21 44	21 42	21 40	21 38	21 35	21 32
	21	23 00	22 52	22 42	22 32	22 26	22 20	22 12	22 03	21 59	21 54	21 49	21 44	21 38
	22	23 51	23 38	23 25	23 10	23 01	22 51	22 39	22 25	22 19	22 12	22 04	21 55	21 44
	23	...	...	...	23 51	23 39	23 26	23 11	22 52	22 43	22 33	22 22	22 10	21 55
	24	0 44	0 28	0 10	...	...	...	23 49	23 26	23 15	23 03	22 49	22 32	22 12
	25	1 38	1 19	0 59	0 36	0 23	0 07	...	...	23 57	23 43	23 26	23 07	22 43
	26	2 33	2 13	1 52	1 27	1 12	0 55	0 35	0 09	...	...	...	23 59	23 33
	27	3 28	3 08	2 46	2 21	2 06	1 49	1 29	1 03	0 50	0 36	0 19	...	...
	28	4 21	4 02	3 42	3 18	3 04	2 48	2 30	2 05	1 54	1 40	1 25	1 07	0 45
	29	5 12	4 55	4 37	4 16	4 04	3 50	3 34	3 13	3 04	2 52	2 40	2 26	2 08
	30	5 59	5 45	5 31	5 14	5 04	4 53	4 40	4 23	4 16	4 07	3 58	3 47	3 34
Aug.	31	6 43	6 33	6 22	6 10	6 02	5 54	5 45	5 33	5 27	5 21	5 14	5 07	4 58
	1	7 25	7 19	7 12	7 04	6 59	6 54	6 48	6 41	6 38	6 34	6 30	6 25	6 20
	2	8 06	8 03	8 00	7 57	7 55	7 53	7 51	7 48	7 46	7 45	7 43	7 42	7 40
	3	8 45	8 46	8 48	8 49	8 50	8 51	8 52	8 54	8 54	8 55	8 56	8 57	8 58
	4	9 25	9 30	9 36	9 42	9 45	9 49	9 54	10 00	10 03	10 06	10 09	10 12	10 16
	5	10 06	10 15	10 25	10 35	10 42	10 49	10 58	11 07	11 12	11 17	11 23	11 30	11 37
	6	10 50	11 02	11 16	11 31	11 40	11 50	12 02	12 17	12 24	12 32	12 40	12 50	13 01
	7	11 37	11 53	12 09	12 29	12 40	12 53	13 09	13 28	13 37	13 47	13 59	14 12	14 29
	8	12 28	12 46	13 06	13 28	13 42	13 57	14 16	14 39	14 50	15 03	15 18	15 35	15 56
	9	13 22	13 42	14 04	14 29	14 44	15 00	15 21	15 47	16 00	16 14	16 31	16 51	17 17
	10	14 20	14 41	15 03	15 28	15 43	16 00	16 21	16 47	17 00	17 14	17 31	17 52	18 18
	11	15 20	15 40	16 00	16 24	16 37	16 53	17 12	17 36	17 47	18 00	18 15	18 32	18 54
	12	16 20	16 37	16 54	17 14	17 26	17 39	17 55	18 14	18 23	18 34	18 45	18 58	19 13
	13	17 18	17 31	17 44	18 00	18 08	18 18	18 30	18 44	18 50	18 58	19 06	19 15	19 25
	14	18 14	18 22	18 30	18 40	18 46	18 52	18 59	19 08	19 12	19 16	19 21	19 26	19 33
	15	19 08	19 11	19 14	19 18	19 20	19 23	19 25	19 29	19 30	19 32	19 34	19 36	19 38
	16	20 00	19 58	19 56	19 54	19 53	19 52	19 50	19 48	19 47	19 46	19 45	19 44	19 43
	17	20 52	20 46	20 38	20 30	20 26	20 21	20 15	20 08	20 05	20 01	19 57	19 53	19 48

MOONSET, 1935

673

LOCAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
July		^h ^m	^h ^m	^h ^m	^h ^m	^h ^m	^h ^m	^h ^m	^h ^m	^h ^m	^h ^m	^h ^m	^h ^m	^h ^m
	1	18 51	19 08	19 26	19 47	19 59	20 13	20 29	20 49	20 58	21 09	21 21	21 35	21 51
	2	19 39	19 53	20 08	20 25	20 35	20 46	20 59	21 15	21 22	21 30	21 40	21 50	22 01
	3	20 24	20 35	20 46	20 59	21 06	21 14	21 24	21 36	21 41	21 47	21 53	22 00	22 09
	4	21 06	21 13	21 21	21 29	21 34	21 39	21 45	21 52	21 56	21 59	22 04	22 08	22 13
	5	21 47	21 50	21 53	21 57	21 59	22 02	22 04	22 07	22 09	22 11	22 12	22 14	22 17
	6	22 27	22 26	22 25	22 24	22 24	22 23	22 23	22 22	22 21	22 21	22 20	22 20	22 19
	7	23 07	23 02	22 57	22 52	22 49	22 45	22 41	22 36	22 34	22 32	22 29	22 26	22 22
	8	23 48	23 40	23 31	23 21	23 15	23 09	23 01	22 52	22 48	22 43	22 38	22 32	22 26
	9	...	...	...	23 53	23 44	23 35	23 24	23 10	23 04	22 57	22 50	22 41	22 31
	10	0 32	0 20	0 07	...	...	...	23 51	23 33	23 25	23 16	23 05	22 53	22 39
	11	1 19	1 04	0 48	0 29	0 18	0 06	...	...	23 53	23 41	23 28	23 12	22 53
	12	2 11	1 53	1 34	1 11	0 58	0 43	0 26	0 03	...	...	...	23 42	23 18
	13	3 07	2 47	2 26	2 01	1 46	1 30	1 09	0 44	0 32	0 18	0 02	...	...
	14	4 07	3 46	3 24	2 59	2 43	2 26	2 05	1 39	1 26	1 11	0 54	0 33	0 07
	15	5 08	4 48	4 28	4 04	3 50	3 33	3 13	2 49	2 37	2 23	2 07	1 48	1 25
	16	6 08	5 51	5 33	5 13	5 01	4 47	4 30	4 10	4 00	3 49	3 36	3 22	3 04
	17	7 06	6 53	6 40	6 24	6 15	6 04	5 52	5 37	5 30	5 22	5 13	5 03	4 51
	18	8 00	7 52	7 44	7 34	7 28	7 21	7 14	7 04	7 00	6 55	6 50	6 44	6 37
	19	8 53	8 50	8 46	8 42	8 40	8 37	8 34	8 30	8 28	8 26	8 24	8 22	8 19
	20	9 43	9 45	9 47	9 48	9 50	9 51	9 52	9 54	9 55	9 56	9 57	9 58	9 59
	21	10 33	10 40	10 46	10 54	10 59	11 04	11 10	11 16	11 20	11 23	11 28	11 32	11 37
	22	11 24	11 35	11 46	11 59	12 07	12 16	12 26	12 38	12 44	12 50	12 58	13 06	13 15
	23	12 16	12 31	12 46	13 04	13 15	13 27	13 41	13 59	14 07	14 16	14 27	14 39	14 53
	24	13 10	13 27	13 46	14 08	14 21	14 36	14 54	15 16	15 26	15 38	15 52	16 08	16 27
	25	14 04	14 24	14 45	15 10	15 24	15 41	16 01	16 26	16 38	16 52	17 08	17 28	17 52
	26	15 00	15 20	15 42	16 07	16 22	16 39	17 00	17 26	17 38	17 53	18 10	18 30	18 56
	27	15 54	16 14	16 35	16 59	17 13	17 30	17 49	18 14	18 26	18 39	18 55	19 13	19 36
	28	16 46	17 04	17 24	17 44	17 57	18 12	18 29	18 50	19 01	19 12	19 25	19 40	19 58
	29	17 35	17 50	18 06	18 24	18 35	18 47	19 01	19 19	19 27	19 36	19 46	19 58	20 11
	30	18 20	18 32	18 45	18 59	19 08	19 17	19 28	19 41	19 47	19 54	20 01	20 10	20 19
Aug.	31	19 04	19 12	19 21	19 30	19 36	19 43	19 50	19 59	20 03	20 08	20 12	20 18	20 24
	1	19 45	19 49	19 54	19 59	20 02	20 06	20 10	20 15	20 17	20 19	20 22	20 25	20 28
	2	20 25	20 25	20 26	20 27	20 27	20 28	20 28	20 29	20 30	20 30	20 30	20 31	20 31
	3	21 04	21 01	20 58	20 54	20 52	20 50	20 47	20 43	20 42	20 40	20 38	20 36	20 34
	4	21 45	21 38	21 31	21 22	21 18	21 12	21 06	20 58	20 55	20 51	20 47	20 42	20 37
	5	22 27	22 16	22 05	21 53	21 45	21 37	21 27	21 16	21 10	21 04	20 58	20 50	20 42
	6	23 12	22 58	22 43	22 26	22 16	22 05	21 52	21 36	21 28	21 20	21 11	21 00	20 48
	7	...	23 44	23 26	23 05	22 53	22 39	22 22	22 02	21 52	21 42	21 30	21 16	20 59
	8	0 01	...	...	23 50	23 36	23 20	23 01	22 37	22 25	22 12	21 57	21 39	21 18
	9	0 53	0 34	0 14	...	...	...	23 49	23 23	23 10	22 56	22 39	22 19	21 53
	10	1 50	1 30	1 08	0 42	0 27	0 10	...	...	...	23 58	23 41	23 21	22 55
	11	2 49	2 29	2 08	1 43	1 28	1 11	0 50	0 25	0 12	...	...	...	...
	12	3 49	3 31	3 12	2 49	2 36	2 21	2 02	1 40	1 29	1 16	1 02	0 45	0 24
	13	4 48	4 34	4 18	3 59	3 49	3 36	3 22	3 04	2 55	2 46	2 36	2 23	2 08
	14	5 45	5 35	5 24	5 11	5 03	4 55	4 44	4 32	4 26	4 20	4 13	4 05	3 56
	15	6 40	6 34	6 28	6 21	6 17	6 13	6 07	6 01	5 58	5 54	5 51	5 47	5 42
	16	7 33	7 32	7 31	7 31	7 30	7 30	7 29	7 28	7 28	7 28	7 27	7 26	7 26
	17	8 25	8 29	8 34	8 39	8 42	8 46	8 50	8 54	8 57	8 59	9 02	9 05	9 08

MOONRISE, 1935

LOCAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Aug.	16	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
	17	20 00	19 58	19 56	19 54	19 53	19 52	19 50	19 48	19 47	19 46	19 45	19 44	19 43
	18	20 52	20 46	20 38	20 30	20 26	20 21	20 15	20 08	20 05	20 01	19 57	19 53	19 48
	19	21 45	21 34	21 22	21 08	21 01	20 52	20 42	20 30	20 24	20 18	20 11	20 04	19 55
	20	22 38	22 23	22 08	21 49	21 39	21 27	21 13	20 56	20 48	20 39	20 29	20 18	20 04
	21	23 33	23 16	22 56	22 34	22 21	22 07	21 49	21 28	21 17	21 06	20 53	20 38	20 20
	22	...	...	23 48	23 24	23 09	22 53	22 33	22 08	21 56	21 43	21 28	21 10	20 46
	23	0 29	0 09	...	...	...	23 45	23 24	22 59	22 46	22 32	22 15	21 55	21 29
	24	1 24	1 04	0 42	0 17	0 02	...	...	23 58	23 46	23 33	23 17	22 59	22 35
	25	2 18	1 58	1 37	1 14	0 59	0 43	0 23	...	...	...	...	...	23 54
	26	3 08	2 51	2 32	2 11	1 58	1 44	1 26	1 04	0 54	0 42	0 29	0 13	...
	27	3 56	3 42	3 26	3 08	2 58	2 45	2 31	2 14	2 05	1 56	1 45	1 33	1 19
	28	4 41	4 30	4 18	4 04	3 56	3 47	3 36	3 23	3 16	3 10	3 02	2 53	2 44
	29	5 24	5 16	5 08	4 58	4 53	4 47	4 40	4 31	4 27	4 22	4 17	4 12	4 05
	30	6 05	6 01	5 56	5 52	5 49	5 46	5 42	5 38	5 36	5 34	5 31	5 28	5 25
	31	6 45	6 45	6 44	6 44	6 44	6 44	6 44	6 44	6 44	6 44	6 44	6 44	6 44
Sept.	1	7 24	7 28	7 32	7 36	7 39	7 42	7 46	7 50	7 52	7 54	7 56	7 59	8 02
	2	8 05	8 12	8 20	8 30	8 35	8 41	8 48	8 57	9 01	9 05	9 10	9 16	9 22
	3	8 48	8 59	9 11	9 24	9 32	9 41	9 52	10 05	10 11	10 18	10 26	10 34	10 44
	4	9 33	9 47	10 02	10 20	10 31	10 43	10 57	11 14	11 23	11 32	11 42	11 54	12 08
	5	10 21	10 38	10 57	11 18	11 31	11 45	12 03	12 24	12 35	12 46	13 00	13 16	13 34
	6	11 13	11 32	11 53	12 17	12 31	12 48	13 07	13 32	13 44	13 58	14 14	14 33	14 56
	7	12 08	12 28	12 50	13 15	13 30	13 47	14 08	14 34	14 46	15 01	15 18	15 38	16 04
	8	13 05	13 25	13 46	14 10	14 25	14 41	15 01	15 26	15 38	15 52	16 08	16 26	16 50
	9	14 03	14 21	14 40	15 02	15 15	15 29	15 47	16 08	16 18	16 30	16 43	16 58	17 16
	10	15 01	15 15	15 31	15 48	15 59	16 10	16 24	16 41	16 49	16 57	17 07	17 18	17 30
	11	15 57	16 07	16 18	16 31	16 38	16 46	16 56	17 07	17 13	17 18	17 25	17 32	17 40
	12	16 51	16 57	17 03	17 10	17 14	17 18	17 24	17 30	17 32	17 36	17 39	17 43	17 47
	13	17 45	17 46	17 46	17 47	17 48	17 49	17 49	17 50	17 51	17 51	17 52	17 52	17 52
	14	18 38	18 34	18 29	18 24	18 21	18 18	18 15	18 10	18 08	18 06	18 04	18 01	17 58
	15	19 32	19 23	19 13	19 02	18 56	18 49	18 41	18 32	18 27	18 23	18 17	18 11	18 05
	16	20 27	20 14	20 00	19 44	19 34	19 24	19 12	18 57	18 50	18 42	18 34	18 24	18 14
	17	21 23	21 07	20 49	20 28	20 16	20 03	19 47	19 28	19 18	19 08	18 56	18 43	18 27
	18	22 21	22 02	21 41	21 18	21 04	20 48	20 29	20 06	19 54	19 42	19 29	19 10	18 49
	19	23 18	22 58	22 36	22 11	21 57	21 40	21 19	20 54	20 42	20 28	20 11	19 52	19 27
	20	...	23 53	23 32	23 08	22 53	22 37	22 17	21 52	21 39	21 26	21 10	20 51	20 27
	21	0 13	...	...	...	23 52	23 37	23 19	22 57	22 46	22 34	22 20	22 03	21 43
	22	1 05	0 47	0 28	0 06	...	...	...	...	23 56	23 46	23 35	23 22	23 06
	23	1 54	1 39	1 22	1 03	0 52	0 39	0 24	0 05	...	...	...	...	...
	24	2 40	2 27	2 14	1 59	1 50	1 40	1 28	1 14	1 07	1 00	0 51	0 41	0 30
	25	3 23	3 14	3 05	2 54	2 48	2 40	2 32	2 22	2 17	2 12	2 06	2 00	1 52
	26	4 04	3 59	3 53	3 47	3 44	3 39	3 35	3 29	3 26	3 23	3 20	3 16	3 12
	27	4 44	4 43	4 41	4 40	4 39	4 38	4 36	4 35	4 34	4 34	4 33	4 32	4 31
	28	5 24	5 27	5 29	5 32	5 34	5 36	5 37	5 41	5 42	5 44	5 45	5 47	5 49
	29	6 05	6 11	6 18	6 25	6 30	6 35	6 41	6 48	6 51	6 55	6 59	7 03	7 08
	30	6 47	6 56	7 07	7 19	7 26	7 34	7 44	7 56	8 01	8 07	8 13	8 21	8 29
Oct.	1	7 31	7 44	7 59	8 15	8 25	8 36	8 49	9 05	9 12	9 21	9 30	9 40	9 53
	2	8 18	8 34	8 52	9 12	9 24	9 38	9 54	10 14	10 24	10 35	10 47	11 01	11 18
	3	9 09	9 27	9 47	10 10	10 24	10 40	10 59	11 22	11 33	11 46	12 01	12 19	12 41

MOONSET, 1935

675

LOCAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date		0°	+ 10°	+ 20°	+ 30°	+ 35°	+ 40°	+ 45°	+ 50°	+ 52°	+ 54°	+ 56°	+ 58°	+ 60°
Aug.	16	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
	17	7 33	7 32	7 31	7 31	7 30	7 30	7 29	7 28	7 28	7 28	7 27	7 26	7 26
	18	8 25	8 29	8 34	8 39	8 42	8 46	8 50	8 54	8 57	8 59	9 02	9 05	9 08
	19	9 17	9 26	9 36	9 47	9 53	10 00	10 09	10 19	10 24	10 29	10 35	10 42	10 50
	20	10 10	10 24	10 38	10 54	11 04	11 14	11 27	11 43	11 50	11 59	12 08	12 18	12 30
	21	11 05	11 21	11 39	12 00	12 12	12 26	12 43	13 03	13 13	13 24	13 37	13 51	14 09
	22	12 00	12 19	12 40	13 03	13 17	13 34	13 53	14 17	14 29	14 42	14 58	15 16	15 38
	23	12 56	13 16	13 37	14 03	14 17	14 34	14 55	15 21	15 33	15 48	16 04	16 25	16 50
	24	13 50	14 10	14 32	14 56	15 11	15 28	15 48	16 13	16 25	16 38	16 54	17 13	17 37
	25	14 43	15 01	15 21	15 43	15 57	16 12	16 30	16 52	17 03	17 15	17 29	17 45	18 04
	26	15 32	15 48	16 05	16 25	16 36	16 49	17 04	17 23	17 32	17 41	17 52	18 05	18 20
	27	16 18	16 31	16 45	17 01	17 10	17 20	17 32	17 47	17 54	18 01	18 09	18 18	18 29
	28	17 02	17 12	17 22	17 33	17 40	17 47	17 56	18 06	18 11	18 16	18 22	18 28	18 35
	29	17 44	17 49	17 56	18 03	18 06	18 11	18 17	18 22	18 25	18 28	18 32	18 35	18 40
	30	18 24	18 26	18 28	18 30	18 32	18 33	18 35	18 37	18 38	18 39	18 40	18 42	18 43
	31	19 04	19 02	19 00	18 58	18 56	18 55	18 54	18 52	18 50	18 49	18 49	18 47	18 46
Sept.	1	19 44	19 38	19 32	19 25	19 22	19 18	19 12	19 06	19 04	19 01	18 57	18 54	18 50
	2	20 25	20 16	20 06	19 55	19 49	19 41	19 33	19 23	19 18	19 13	19 07	19 01	18 54
	3	21 09	20 56	20 43	20 27	20 18	20 08	19 56	19 42	19 35	19 28	19 20	19 10	19 00
	4	21 56	21 40	21 23	21 03	20 52	20 39	20 24	20 05	19 57	19 47	19 36	19 24	19 09
	5	22 46	22 27	22 08	21 45	21 32	21 16	20 58	20 36	20 25	20 13	19 59	19 43	19 24
	6	23 39	23 19	22 58	22 33	22 19	22 02	21 42	21 16	21 04	20 50	20 34	20 15	19 51
	7	...	...	23 53	23 28	23 14	22 56	22 36	22 10	21 57	21 42	21 26	21 05	20 40
	8	0 35	0 15	...	...	...	...	23 40	23 16	23 04	22 51	22 36	22 17	21 55
	9	1 33	1 14	0 54	0 30	0 16	0 00	...	...	...	...	...	23 46	23 29
	10	2 31	2 14	1 57	1 37	1 24	1 11	0 54	0 34	0 24	0 13	0 01	...	...
	11	3 28	3 15	3 02	2 46	2 37	2 27	2 14	1 59	1 52	1 44	1 35	1 24	1 13
	12	4 23	4 15	4 06	3 56	3 50	3 43	3 35	3 26	3 22	3 16	3 11	3 05	2 58
	13	5 17	5 14	5 10	5 06	5 04	5 01	4 58	4 54	4 52	4 50	4 48	4 46	4 43
	14	6 10	6 12	6 14	6 16	6 17	6 18	6 20	6 22	6 23	6 24	6 25	6 26	6 27
	15	7 03	7 10	7 17	7 26	7 30	7 36	7 42	7 49	7 53	7 57	8 01	8 06	8 11
	16	7 58	8 09	8 21	8 35	8 43	8 52	9 03	9 16	9 23	9 29	9 37	9 46	9 55
	17	8 54	9 09	9 25	9 44	9 55	10 08	10 23	10 41	10 50	11 00	11 11	11 24	11 39
	18	9 51	10 09	10 28	10 51	11 04	11 20	11 38	12 00	12 12	12 24	12 38	12 55	13 15
	19	10 48	11 08	11 29	11 54	12 08	12 25	12 45	13 10	13 22	13 36	13 53	14 12	14 36
	20	11 44	12 04	12 26	12 50	13 05	13 22	13 42	14 08	14 20	14 34	14 50	15 10	15 33
	21	12 38	12 57	13 17	13 41	13 54	14 10	14 29	14 52	15 03	15 16	15 30	15 47	16 07
	22	13 29	13 46	14 04	14 24	14 36	14 50	15 06	15 25	15 35	15 45	15 57	16 10	16 26
	23	14 16	14 30	14 45	15 02	15 12	15 23	15 36	15 51	15 58	16 07	16 16	16 26	16 38
	24	15 01	15 11	15 23	15 35	15 43	15 51	16 00	16 12	16 17	16 23	16 30	16 37	16 45
	25	15 43	15 50	15 57	16 06	16 10	16 16	16 22	16 29	16 33	16 36	16 41	16 45	16 50
	26	16 23	16 27	16 30	16 34	16 36	16 39	16 42	16 45	16 46	16 48	16 50	16 52	16 54
	27	17 03	17 03	17 02	17 01	17 01	17 01	17 00	17 00	16 59	16 59	16 59	16 58	16 58
	28	17 43	17 39	17 34	17 29	17 26	17 23	17 19	17 14	17 12	17 10	17 08	17 05	17 01
	29	18 25	18 17	18 08	17 59	17 53	17 47	17 39	17 31	17 27	17 22	17 17	17 12	17 06
	30	19 08	18 56	18 44	18 30	18 22	18 13	18 02	17 49	17 43	17 36	17 29	17 21	17 12
Oct.	1	19 54	19 39	19 23	19 05	18 54	18 42	18 28	18 11	18 03	17 54	17 44	17 33	17 20
	2	20 42	20 25	20 06	19 44	19 32	19 18	19 01	18 40	18 30	18 18	18 06	17 51	17 34
	3	21 34	21 15	20 54	20 30	20 16	20 00	19 40	19 16	19 05	18 52	18 37	18 18	17 57

MOONRISE, 1935

LOCAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Oct.	1	8 18	8 34	8 52	9 12	9 24	9 38	9 54	10 14	10 24	10 35	10 47	11 01	11 18
	2	9 09	9 27	9 47	10 10	10 24	10 40	10 59	11 22	11 33	11 46	12 01	12 19	12 41
	3	10 02	10 22	10 43	11 08	11 22	11 39	11 59	12 25	12 37	12 51	13 08	13 28	13 52
	4	10 57	11 17	11 38	12 03	12 17	12 34	12 54	13 19	13 31	13 45	14 01	14 20	14 44
	5	11 53	12 12	12 31	12 54	13 07	13 23	13 41	14 03	14 14	14 26	14 40	14 57	15 16
	6	12 49	13 05	13 22	13 41	13 52	14 05	14 20	14 39	14 47	14 57	15 08	15 20	15 34
	7	13 43	13 56	14 08	14 23	14 32	14 41	14 53	15 07	15 13	15 20	15 28	15 36	15 46
	8	14 37	14 44	14 53	15 02	15 08	15 14	15 21	15 30	15 34	15 38	15 43	15 48	15 54
	9	15 29	15 32	15 36	15 40	15 42	15 45	15 48	15 51	15 53	15 54	15 56	15 58	16 01
	10	16 21	16 20	16 18	16 16	16 15	16 14	16 12	16 11	16 10	16 09	16 08	16 08	16 07
	11	17 15	17 08	17 01	16 54	16 49	16 44	16 39	16 32	16 29	16 26	16 22	16 18	16 13
	12	18 10	17 59	17 47	17 34	17 26	17 18	17 07	16 55	16 50	16 44	16 37	16 30	16 21
	13	19 07	18 52	18 36	18 18	18 07	17 55	17 41	17 24	17 16	17 07	16 57	16 46	16 33
	14	20 06	19 48	19 28	19 06	18 53	18 39	18 21	18 00	17 50	17 38	17 25	17 10	16 52
	15	21 05	20 45	20 24	20 00	19 46	19 29	19 10	18 45	18 33	18 20	18 04	17 46	17 24
	16	22 02	21 43	21 22	20 57	20 43	20 26	20 06	19 41	19 29	19 15	18 59	18 40	18 16
	17	22 58	22 39	22 19	21 56	21 42	21 27	21 08	20 45	20 34	20 21	20 06	19 49	19 28
	18	23 49	23 32	23 15	22 55	22 43	22 30	22 13	21 54	21 44	21 33	21 21	21 07	20 51
	19	...	...	...	23 52	23 43	23 32	23 19	23 03	22 56	22 48	22 38	22 28	22 16
	20	0 36	0 23	0 09	...	...	...	...	...	...	...	23 54	23 47	23 39
	21	1 20	1 11	1 00	0 48	0 41	0 33	0 24	0 12	0 07	0 01	...	...	...
	22	2 02	1 56	1 49	1 42	1 37	1 32	1 26	1 19	1 16	1 12	1 08	1 04	0 59
	23	2 43	2 40	2 38	2 34	2 32	2 31	2 28	2 25	2 24	2 23	2 21	2 19	2 17
	24	3 23	3 24	3 25	3 27	3 27	3 29	3 30	3 31	3 32	3 32	3 33	3 34	3 35
	25	4 03	4 08	4 13	4 20	4 23	4 27	4 32	4 38	4 40	4 43	4 46	4 50	4 54
	26	4 45	4 54	5 03	5 13	5 20	5 27	5 35	5 45	5 50	5 55	6 00	6 07	6 14
	27	5 29	5 41	5 54	6 09	6 18	6 28	6 40	6 54	7 01	7 08	7 17	7 26	7 37
	28	6 16	6 31	6 47	7 06	7 16	7 30	7 46	8 04	8 13	8 23	8 34	8 47	9 02
	29	7 05	7 23	7 42	8 05	8 18	8 33	8 51	9 13	9 24	9 36	9 50	10 07	10 26
	30	7 58	8 18	8 38	9 03	9 17	9 33	9 53	10 18	10 30	10 44	11 00	11 18	11 42
Nov.	31	8 53	9 13	9 34	9 58	10 13	10 30	10 50	11 15	11 27	11 41	11 57	12 16	12 40
	1	9 48	10 07	10 27	10 50	11 04	11 20	11 38	12 02	12 13	12 25	12 40	12 57	13 17
	2	10 43	11 00	11 18	11 38	11 50	12 03	12 19	12 39	12 48	12 58	13 10	13 23	13 39
	3	11 37	11 50	12 04	12 21	12 30	12 41	12 53	13 08	13 15	13 23	13 32	13 42	13 52
	4	12 29	12 38	12 48	12 59	13 06	13 14	13 22	13 32	13 37	13 42	13 48	13 54	14 02
	5	13 20	13 25	13 30	13 36	13 39	13 43	13 48	13 54	13 56	13 59	14 02	14 05	14 09
	6	14 10	14 10	14 11	14 11	14 12	14 12	14 12	14 13	14 13	14 14	14 14	14 14	14 15
	7	15 01	14 56	14 52	14 47	14 44	14 41	14 37	14 33	14 31	14 28	14 26	14 24	14 21
	8	15 54	15 45	15 35	15 25	15 19	15 12	15 04	14 55	14 50	14 46	14 40	14 34	14 28
	9	16 49	16 36	16 22	16 06	15 57	15 47	15 35	15 20	15 14	15 06	14 58	14 49	14 38
	10	17 47	17 30	17 13	16 52	16 41	16 27	16 12	15 52	15 43	15 33	15 22	15 09	14 53
	11	18 46	18 28	18 08	17 44	17 31	17 15	16 56	16 33	16 22	16 10	15 56	15 39	15 19
	12	19 46	19 26	19 05	18 41	18 27	18 10	17 50	17 25	17 13	16 59	16 44	16 25	16 01
	13	20 44	20 25	20 04	19 41	19 27	19 11	18 52	18 27	18 16	18 02	17 47	17 29	17 07
	14	21 38	21 21	21 03	20 42	20 29	20 15	19 58	19 36	19 26	19 15	19 02	18 46	18 28
	15	22 29	22 14	21 59	21 41	21 31	21 19	21 05	20 48	20 39	20 30	20 20	20 08	19 54
	16	23 15	23 04	22 52	22 38	22 31	22 22	22 11	21 58	21 52	21 45	21 38	21 29	21 20
	17	23 58	23 51	23 43	23 34	23 28	23 22	23 15	23 07	23 03	22 58	22 54	22 48	22 42

MOONSET, 1935

677

LOCAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Oct.	1	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
	2	20 42	20 25	20 06	19 44	19 32	19 18	19 01	18 40	18 30	18 18	18 06	17 51	17 34
	3	21 34	21 15	20 54	20 30	20 16	20 00	19 40	19 16	19 05	18 52	18 37	18 18	17 57
	4	22 28	22 08	21 47	21 22	21 07	20 50	20 30	20 04	19 52	19 38	19 22	19 02	18 37
	5	23 24	23 05	22 44	22 20	22 05	21 49	21 29	21 05	20 52	20 39	20 23	20 04	19 41
	6	...	...	23 44	23 22	23 10	22 55	22 38	22 16	22 05	21 54	21 39	21 24	21 05
	7	0 20	0 02	...	...	...	...	23 52	23 34	23 26	23 17	23 07	22 55	22 42
	8	1 15	1 01	0 46	0 28	0 18	0 06	...	...	...	...	...	...	...
	9	2 09	1 58	1 48	1 35	1 28	1 19	1 10	0 57	0 52	0 46	0 39	0 31	0 22
	10	3 02	2 56	2 50	2 43	2 39	2 34	2 29	2 22	2 19	2 16	2 12	2 08	2 03
	11	3 54	3 53	3 52	3 51	3 50	3 50	3 49	3 48	3 47	3 47	3 46	3 46	3 45
	12	4 46	4 50	4 55	5 00	5 03	5 06	5 10	5 14	5 16	5 19	5 21	5 24	5 27
	13	5 41	5 50	5 59	6 10	6 16	6 23	6 32	6 42	6 47	6 52	6 58	7 04	7 12
	14	6 37	6 50	7 04	7 20	7 30	7 41	7 54	8 09	8 17	8 25	8 34	8 44	8 57
	15	7 35	7 52	8 09	8 30	8 42	8 56	9 13	9 34	9 43	9 54	10 07	10 22	10 39
	16	8 34	8 53	9 13	9 37	9 51	10 07	10 26	10 50	11 02	11 15	11 31	11 49	12 11
	17	9 33	9 53	10 14	10 38	10 53	11 10	11 30	11 55	12 07	12 21	12 37	12 57	13 21
	18	10 29	10 48	11 09	11 33	11 47	12 03	12 22	12 46	12 57	13 10	13 25	13 44	14 04
	19	11 23	11 40	11 59	12 20	12 32	12 47	13 04	13 23	13 34	13 45	13 58	14 12	14 29
	20	12 12	12 27	12 43	13 00	13 11	13 23	13 37	13 54	14 02	14 10	14 20	14 31	14 44
	21	12 58	13 09	13 22	13 36	13 44	13 53	14 04	14 16	14 22	14 29	14 36	14 44	14 53
	22	13 41	13 49	13 58	14 07	14 13	14 20	14 26	14 35	14 39	14 43	14 48	14 53	14 59
	23	14 22	14 26	14 31	14 36	14 39	14 43	14 47	14 51	14 53	14 56	14 58	15 01	15 04
	24	15 02	15 03	15 03	15 04	15 05	15 05	15 06	15 06	15 07	15 07	15 07	15 08	15 08
	25	15 42	15 39	15 36	15 32	15 30	15 27	15 25	15 21	15 20	15 18	15 16	15 14	15 12
	26	16 23	16 16	16 09	16 01	15 56	15 51	15 44	15 37	15 34	15 30	15 26	15 21	15 16
	27	17 06	16 55	16 44	16 32	16 24	16 16	16 07	15 55	15 50	15 44	15 38	15 30	15 22
	28	17 51	17 37	17 23	17 06	16 56	16 45	16 32	16 16	16 09	16 01	15 52	15 42	15 30
	29	18 39	18 23	18 05	17 45	17 33	17 19	17 03	16 44	16 34	16 24	16 12	15 58	15 43
	30	19 30	19 12	18 52	18 29	18 15	18 00	17 41	17 18	17 07	16 54	16 40	16 23	16 03
	31	20 24	20 05	19 43	19 19	19 04	18 48	18 28	18 03	17 51	17 37	17 21	17 02	16 38
Nov.	1	21 20	21 00	20 39	20 15	20 01	19 44	19 24	19 00	18 48	18 34	18 18	17 59	17 35
	2	22 15	21 57	21 38	21 16	21 03	20 48	20 29	20 07	19 56	19 44	19 30	19 13	18 53
	3	23 09	22 54	22 38	22 19	22 08	21 55	21 40	21 22	21 13	21 04	20 52	20 39	20 24
	4	...	23 50	23 38	23 24	23 16	23 06	22 55	22 41	22 35	22 28	22 20	22 11	22 00
	5	0 02	...	...	...	...	...	...	...	23 58	23 54	23 49	23 43	23 37
	6	0 53	0 46	0 38	0 29	0 24	0 19	0 10	0 02	...	...	...	...	...
	7	1 43	1 40	1 38	1 34	1 32	1 30	1 27	1 24	1 22	1 21	1 19	1 17	1 15
	8	2 34	2 36	2 38	2 40	2 41	2 43	2 44	2 46	2 47	2 48	2 50	2 51	2 52
	9	3 25	3 32	3 39	3 47	3 52	3 57	4 03	4 11	4 14	4 18	4 22	4 27	4 32
	10	4 19	4 30	4 42	4 56	5 04	5 13	5 23	5 36	5 42	5 49	5 57	6 05	6 14
	11	5 16	5 30	5 47	6 06	6 16	6 29	6 44	7 02	7 10	7 20	7 31	7 43	7 58
	12	6 15	6 33	6 52	7 14	7 28	7 43	8 01	8 23	8 34	8 46	9 00	9 16	9 36
	13	7 15	7 34	7 56	8 20	8 34	8 51	9 10	9 35	9 47	10 01	10 16	10 33	10 58
	14	8 14	8 34	8 55	9 19	9 33	9 50	10 09	10 34	10 46	10 59	11 14	11 35	11 55
	15	9 11	9 29	9 48	10 11	10 24	10 39	10 56	11 18	11 29	11 41	11 54	12 10	12 28
	16	10 03	10 19	10 36	10 55	11 06	11 19	11 34	11 52	12 01	12 10	12 21	12 34	12 48
	17	10 52	11 04	11 18	11 33	11 43	11 52	12 04	12 18	12 25	12 32	12 40	12 49	12 59
	18	11 36	11 46	11 55	12 07	12 13	12 20	12 29	12 39	12 43	12 48	12 54	13 00	13 07

MOONRISE, 1935

LOCAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1935

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Nov. 16	h m 23 15	h m 23 04	h m 22 52	h m 22 38	h m 22 31	h m 22 22	h m 22 11	h m 21 58	h m 21 52	h m 21 45	h m 21 38	h m 21 29	h m 21 20
17	23 58	23 51	23 43	23 34	23 28	23 22	23 15	23 07	23 03	22 58	22 54	22 48	22 42
18	...	...	...	...	...	...	...	...	...	...	...	...	...
19	0 40	0 36	0 32	0 27	0 24	0 21	0 18	0 13	0 11	0 09	0 07	0 04	0 01
20	1 20	1 20	1 19	1 19	1 19	1 19	1 19	1 19	1 19	1 19	1 19	1 19	1 19
21	2 00	2 03	2 07	2 12	2 14	2 17	2 21	2 25	2 27	2 29	2 31	2 34	2 37
22	2 41	2 48	2 56	3 05	3 10	3 16	3 23	3 32	3 36	3 40	3 45	3 50	3 56
23	3 24	3 35	3 47	4 00	4 08	4 17	4 28	4 40	4 46	4 53	5 00	5 09	5 18
24	4 10	4 24	4 39	4 57	5 07	5 19	5 33	5 50	5 58	6 07	6 18	6 30	6 43
25	4 59	5 16	5 34	5 55	6 08	6 22	6 39	7 00	7 11	7 22	7 35	7 50	8 08
26	5 52	6 11	6 31	6 55	7 08	7 25	7 44	8 08	8 20	8 33	8 48	9 06	9 29
27	6 47	7 07	7 28	7 52	8 07	8 23	8 44	9 09	9 21	9 35	9 51	10 10	10 34
28	7 43	8 02	8 23	8 46	9 00	9 16	9 36	9 59	10 11	10 24	10 39	10 56	11 18
29	8 39	8 57	9 15	9 36	9 48	10 02	10 19	10 40	10 50	11 00	11 13	11 27	11 44
30	9 34	9 48	10 03	10 20	10 30	10 42	10 55	11 11	11 19	11 28	11 37	11 47	12 00
Dec. 1	10 26	10 36	10 48	11 00	11 07	11 16	11 25	11 37	11 42	11 48	11 54	12 02	12 10
2	11 16	11 22	11 29	11 37	11 41	11 46	11 52	11 58	12 02	12 05	12 09	12 13	12 18
3	12 05	12 07	12 09	12 11	12 13	12 14	12 16	12 18	12 19	12 20	12 21	12 22	12 24
4	12 54	12 52	12 49	12 46	12 44	12 42	12 40	12 37	12 36	12 34	12 33	12 31	12 29
5	13 44	13 37	13 30	13 21	13 16	13 11	13 05	12 57	12 54	12 50	12 46	12 41	12 36
6	14 37	14 25	14 13	14 00	13 52	13 43	13 33	13 20	13 14	13 08	13 01	12 53	12 44
7	15 32	15 17	15 01	14 42	14 32	14 20	14 06	13 48	13 40	13 31	13 21	13 10	12 57
8	16 30	16 12	15 53	15 31	15 18	15 03	14 45	14 24	14 14	14 02	13 49	13 34	13 16
9	17 29	17 10	16 49	16 25	16 10	15 54	15 35	15 10	14 59	14 46	14 30	14 12	13 50
10	18 28	18 08	17 47	17 23	17 09	16 52	16 33	16 08	15 56	15 42	15 27	15 08	14 45
11	19 24	19 06	18 47	18 24	18 11	17 56	17 38	17 15	17 04	16 52	16 38	16 21	16 00
12	20 18	20 02	19 45	19 26	19 14	19 01	18 46	18 26	18 17	18 07	17 56	17 42	17 27
13	21 06	20 54	20 40	20 25	20 16	20 06	19 54	19 39	19 32	19 24	19 16	19 06	18 54
14	21 52	21 43	21 33	21 22	21 16	21 08	21 00	20 50	20 45	20 40	20 34	20 27	20 20
15	22 34	22 29	22 23	22 17	22 13	22 09	22 04	21 58	21 55	21 52	21 49	21 46	21 41
16	23 15	23 14	23 12	23 10	23 09	23 08	23 06	23 05	23 04	23 03	23 02	23 01	23 00
17	23 55	23 57	...	...	...	...	...	...	...	...	...	...	...
18	...	...	0 00	0 02	0 04	0 06	0 08	0 10	0 12	0 13	0 14	0 16	0 18
19	0 36	0 41	0 48	0 55	0 59	1 04	1 10	1 16	1 20	1 23	1 27	1 31	1 36
20	1 17	1 27	1 37	1 49	1 56	2 04	2 13	2 24	2 29	2 34	2 41	2 48	2 56
21	2 02	2 15	2 29	2 45	2 54	3 05	3 17	3 33	3 40	3 48	3 57	4 07	4 19
22	2 49	3 05	3 22	3 42	3 54	4 07	4 23	4 43	4 52	5 02	5 14	5 28	5 44
23	3 41	3 59	4 18	4 41	4 54	5 10	5 28	5 52	6 03	6 15	6 30	6 47	7 08
24	4 35	4 55	5 16	5 40	5 55	6 11	6 31	6 56	7 08	7 22	7 38	7 57	8 21
25	5 32	5 52	6 13	6 37	6 51	7 08	7 27	7 52	8 04	8 17	8 33	8 52	9 15
26	6 30	6 48	7 07	7 30	7 42	7 58	8 15	8 37	8 48	9 00	9 13	9 29	9 48
27	7 26	7 42	7 58	8 17	8 28	8 40	8 55	9 13	9 21	9 30	9 41	9 53	10 07
28	8 21	8 32	8 45	8 59	9 08	9 17	9 28	9 41	9 47	9 54	10 01	10 10	10 19
29	9 13	9 20	9 28	9 38	9 43	9 49	9 56	10 04	10 08	10 12	10 17	10 22	10 27
30	10 03	10 06	10 09	10 13	10 15	10 18	10 21	10 24	10 26	10 28	10 29	10 32	10 34
31	10 52	10 51	10 49	10 48	10 47	10 46	10 45	10 43	10 43	10 42	10 41	10 40	10 39
32	11 42	11 36	11 30	11 23	11 19	11 14	11 09	11 03	11 00	10 57	10 54	10 50	10 46

679

To obtain standard time see directions under Sunrise and Sunset.
For other longitudes and for southern latitudes see page 680.

Lat. Date		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°	
Nov.	16	10 52	11 04	11 18	11 33	11 43	11 52	12 04	12 18	12 25	12 32	12 40	12 49	12 59	
	17	11 36	11 46	11 55	12 07	12 13	12 20	12 29	12 39	12 43	12 48	12 54	13 00	13 07	
	18	12 18	12 24	12 30	12 37	12 40	12 45	12 50	12 56	12 59	13 02	13 05	13 09	13 13	
	19	12 59	13 01	13 03	13 05	13 06	13 08	13 10	13 12	13 13	13 14	13 15	13 16	13 17	
	20	13 39	13 37	13 35	13 33	13 32	13 30	13 29	13 27	13 26	13 25	13 24	13 23	13 22	
	21	14 19	14 14	14 08	14 01	13 57	13 53	13 48	13 42	13 40	13 37	13 33	13 30	13 26	
	22	15 01	14 52	14 42	14 31	14 25	14 18	14 10	14 00	13 55	13 50	13 44	13 38	13 31	
	23	15 46	15 33	15 20	15 04	14 56	14 46	14 34	14 20	14 13	14 06	13 57	13 49	13 38	
	24	16 33	16 18	16 01	15 42	15 31	15 18	15 03	14 45	14 36	14 26	14 16	14 04	13 49	
	25	17 24	17 06	16 47	16 25	16 12	15 57	15 39	15 17	15 07	14 55	14 41	14 26	14 07	
	26	18 18	17 58	17 37	17 13	16 59	16 42	16 22	15 58	15 46	15 32	15 17	14 58	14 35	
	27	19 14	18 54	18 33	18 09	17 54	17 38	17 18	16 53	16 41	16 27	16 11	15 52	15 28	
	28	20 10	19 51	19 32	19 09	18 56	18 40	18 22	17 58	17 47	17 34	17 20	17 02	16 41	
	29	21 06	20 50	20 32	20 13	20 01	19 48	19 32	19 12	19 03	18 53	18 41	18 27	18 11	
	30	21 59	21 46	21 33	21 17	21 08	20 58	20 46	20 31	20 24	20 16	20 07	19 58	19 46	
	Dec.	1	22 50	22 41	22 32	22 22	22 16	22 09	22 00	21 51	21 46	21 41	21 35	21 29	21 22
		2	23 40	23 35	23 31	23 26	23 23	23 19	23 16	23 11	23 09	23 06	23 04	23 00	22 57
		3
		4	0 28	0 29	0 29	0 30	0 30	0 30	0 30	0 31	0 31	0 31	0 31	0 31	0 32
		5	1 18	1 23	1 28	1 34	1 38	1 41	1 46	1 51	1 54	1 57	2 00	2 04	2 07
		6	2 09	2 18	2 28	2 40	2 47	2 54	3 03	3 14	3 19	3 24	3 30	3 37	3 45
		7	3 03	3 16	3 31	3 47	3 57	4 08	4 21	4 36	4 44	4 52	5 02	5 13	5 25
		8	3 59	4 16	4 34	4 55	5 07	5 21	5 37	5 58	6 08	6 19	6 32	6 46	7 04
		9	4 58	5 17	5 37	6 01	6 15	6 30	6 50	7 14	7 25	7 38	7 53	8 11	8 33
		10	5 57	6 17	6 38	7 03	7 17	7 34	7 53	8 18	8 30	8 44	9 00	9 18	9 42
		11	6 56	7 14	7 35	7 58	8 12	8 28	8 46	9 10	9 21	9 33	9 48	10 05	10 25
		12	7 50	8 08	8 26	8 46	8 58	9 12	9 28	9 49	9 58	10 08	10 20	10 34	10 50
		13	8 42	8 56	9 11	9 28	9 38	9 49	10 02	10 18	10 25	10 34	10 43	10 53	11 05
		14	9 29	9 39	9 51	10 04	10 11	10 19	10 29	10 41	10 46	10 53	10 59	11 06	11 15
		15	10 12	10 20	10 27	10 36	10 41	10 46	10 52	11 00	11 04	11 07	11 12	11 16	11 21
16		10 54	10 58	11 01	11 05	11 08	11 10	11 13	11 16	11 18	11 20	11 22	11 24	11 26	
17		11 34	11 34	11 34	11 33	11 33	11 33	11 32	11 32	11 32	11 32	11 31	11 31	11 31	
18		12 14	12 10	12 06	12 01	11 58	11 55	11 52	11 47	11 45	11 43	11 41	11 38	11 35	
19		12 55	12 48	12 40	12 30	12 25	12 19	12 12	12 04	12 00	11 55	11 51	11 45	11 40	
20		13 38	13 27	13 15	13 02	12 54	12 45	12 35	12 22	12 16	12 10	12 03	11 55	11 46	
21		14 24	14 10	13 54	13 37	13 27	13 15	13 01	12 45	12 37	12 28	12 19	12 08	11 55	
22		15 14	14 56	14 38	14 17	14 05	13 51	13 34	13 14	13 04	12 53	12 40	12 26	12 10	
23		16 06	15 48	15 27	15 04	14 50	14 34	14 15	13 51	13 40	13 27	13 12	12 55	12 34	
24		17 02	16 43	16 22	15 57	15 42	15 26	15 06	14 41	14 28	14 15	13 59	13 39	13 15	
25		18 00	17 41	17 20	16 57	16 43	16 26	16 07	15 43	15 31	15 18	15 03	14 44	14 22	
26		18 57	18 40	18 22	18 01	17 48	17 34	17 17	16 56	16 46	16 34	16 22	16 06	15 48	
27		19 53	19 39	19 24	19 07	18 57	18 46	18 32	18 16	18 08	17 59	17 49	17 38	17 25	
28		20 46	20 36	20 26	20 13	20 06	19 58	19 49	19 37	19 32	19 26	19 19	19 12	19 03	
29		21 37	21 31	21 26	21 19	21 15	21 10	21 05	20 59	20 56	20 53	20 49	20 45	20 41	
30		22 26	22 26	22 24	22 23	22 23	22 22	22 21	22 20	22 19	22 19	22 18	22 17	22 17	
31		23 16	23 19	23 23	23 27	23 30	23 33	23 36	23 40	23 42	23 44	23 47	23 49	23 52	
32		...	...	...	...	...	...	...	...	...	...	...	...	...

MOONRISE AND MOONSET, 1935

FOR NORTHERN STATIONS NOT ON THE MERIDIAN OF GREENWICH,
AND FOR SOUTHERN STATIONS

For northern stations not on the meridian of Greenwich.—For longitudes twelve hours or less west from Greenwich obtain the data for the given latitude from the Table for the given date and for the date following; for longitudes twelve hours or less east from Greenwich obtain the data for the given latitude from the Table for the given date and for the date preceding. Subtract the time on the earlier date from the time on the later and multiply the difference by the twenty-fourth part of the longitude in hours and decimals of an hour, positive if west, and negative if east. Apply the product as a correction to the time on the given date.

For southern stations.—The instant of moonrise or moonset for any station south of the equator is within a few minutes that of moonset or moonrise, respectively, at a place of the same latitude north of the equator whose longitude is twelve hours different from that of the southern station.

If the southern station is twelve hours or less west from Greenwich, and the phenomenon at the southern station occurs between midnight and noon, the local civil day will be the same at the southern and northern stations. If, however, the phenomenon at the southern station occurs between noon and midnight, the local civil day at the northern station will be one day later than at the southern.

If the southern station is twelve hours or less east from Greenwich, and the phenomenon at the southern station occurs between midnight and noon, the local civil day at the northern station will be one day less than at the southern station. If, however, the phenomenon at the southern station occurs between noon and midnight, the local civil day will be the same at the two stations.

Having thus determined the true civil day at the northern station, compute by the rule for northern latitudes. For the desired local mean time of moonrise at the southern station change the time of moonset at the northern station twelve hours, and *add* the correction computed by aid of the table below. For the desired local mean time of moonset at the southern station change the time of moonrise at the northern station twelve hours, and *subtract* the correction computed by aid of the table below. This correction, expressed in minutes of time, is equal to Moon's parallax in minutes of arc—50 multiplied by the factor taken from the table below. This factor is always positive and is the same for northern and southern declinations.

FACTOR FOR COMPUTING CORRECTION FOR SOUTHERN STATIONS

Lat.	0°	10°	20°	30°	35°	40°	45°	50°	52°	54°	56°	58°	60°
δ_c													
0 00	.14	.14	.15	.16	.17	.18	.20	.22	.22	.24	.25	.26	.28
5 00	.14	.14	.15	.16	.17	.18	.20	.22	.23	.24	.25	.26	.28
10 00	.14	.14	.15	.16	.17	.18	.20	.22	.23	.25	.26	.28	.29
15 00	.14	.14	.15	.17	.18	.19	.21	.23	.25	.26	.28	.30	.32
20 00	.15	.15	.16	.17	.18	.20	.22	.25	.27	.29	.31	.34	.38
21 00	.15	.15	.16	.18	.19	.20	.23	.26	.28	.30	.32	.35	.40
22 00	.15	.15	.16	.18	.19	.21	.23	.26	.28	.30	.33	.37	.42
23 00	.15	.15	.16	.18	.19	.21	.23	.27	.29	.31	.34	.39	.44
24 00	.15	.15	.16	.18	.19	.21	.24	.28	.30	.32	.36	.41	.47
25 00	.15	.16	.16	.18	.20	.22	.24	.28	.31	.34	.38	.43	.52
26 00	.15	.16	.17	.18	.20	.22	.25	.29	.32	.35	.40	.46	.57
27 00	.16	.16	.17	.19	.20	.22	.26	.30	.33	.37	.42	.51	.66
28 00	.16	.16	.17	.19	.20	.23	.26	.31	.35	.39	.45	.56	.80
28 40	.16	.16	.17	.19	.21	.23	.27	.32	.36	.41	.48	.61	.98

MOONRISE AND MOONSET, 1935

681

FOR NORTHERN STATIONS NOT ON THE MERIDIAN OF GREENWICH,
AND FOR SOUTHERN STATIONS

Summary of rule for Southern Stations.—Compute the opposite phenomenon for a fictitious northern station of the same latitude, but differing by 12^h in longitude, after correcting the date (if necessary) from the third column of the following table:—

Longitude of Southern Station			Time of Opposite Phenomenon at Northern Station	Correction to Date for Northern Station	Final Correction Necessary
West	...	...	$00-12^h$	$+1^d$	-12^h
			$12-24$	0	
East	...	...	$00-12$	0	$+12$
			$12-24$	-1	

To the time thus found apply 12^h with the sign shown in the last column of the table above. Compute the auxiliary correction Factor \times (Moon's parallax -50) and

Add for Moonrise at southern station

Subtract for Moonset at southern station

If the date thus given is not the one required (as may sometimes happen when the phenomenon occurs near 0^h or 12^h) a new calculation with a revised date will be necessary. It is to be remembered that on one day a month (near first quarter) there will be no moonset, and on one day (near last quarter) no moonrise.

Example.—1935, January 15, local civil date.—Find the time of moonrise and moonset in longitude $9^h 40^m$ east from Greenwich and in latitude $37^\circ 50'$ south.

The longitude of the fictitious northern station is $2^h.3$ west from Greenwich and its latitude is $37^\circ.8$ N. In accordance with the precepts given above, the civil day at the northern station is January 14 for moonrise and January 15 for moonset.

				Moonrise			Moonset		
At northern station—				d	h	m	d	h	m
Table, Lat. $+37^\circ.8$	...	...	...	Jan. 14	12	37	Jan. 15	03	55
Table, Lat. $+37^\circ.8$	...	...	...	15	13	20	16	04	53
Difference	...	...	...			43			58
Product of Diff. by $+\frac{2.3}{24}$						+4			+6
Local mean time	...	...	...	Jan. 14	12	41	Jan. 15	04	01
Declination of Moon	...	...	...			$+24^\circ.1$			$+25^\circ.5$
Parallax of Moon	...	...	...			$56'.1$			$55'.8$
Factor from Table	...	...	...			$.20$			$.21$
Corr. = Factor \times (Parallax in minutes -50)						1^m			1^m
				Moonset			Moonrise		
At southern station—				d	h	m	d	h	m
Time at northern station changed 12^h				Jan. 15	00	41	Jan. 15	16	01
Correction	...	...	...			-1			$+1$
Local mean time	...	...	...	Jan. 15	00	40	Jan. 15	16	02

OBSERVATORIES, 1935 LIST A—ACTIVE OBSERVATORIES

No.	Place	Longitude	Latitude	Altitude	Description
1	Aarhus, Denmark ...	$-0^{\text{h}} 40^{\text{m}} 47.3^{\text{s}}$ b	$+56^{\circ} 07' 40''$	50^{m}	Olé Römer Observatory
2	Abbadia, France ...	$+0^{\text{h}} 07^{\text{m}} 00.1^{\text{s}}$ c	$+43^{\circ} 22' 52.2''$	69	Obs. of Paris Acad. of Sciences, Hendaye
3	Adelaide, South Australia	$-9^{\text{h}} 14^{\text{m}} 19.85^{\text{s}}$ c	$-34^{\circ} 55' 38.0''$	41	Government Observatory
4	Albany,* New York ...	$+4^{\text{h}} 55^{\text{m}} 07.12^{\text{s}}$ c	$+42^{\circ} 39' 12.8''$	70	Dudley Observatory
5	Algiers, Algeria ...	$-0^{\text{h}} 12^{\text{m}} 08.53^{\text{s}}$ c	$+36^{\circ} 48' 04.8''$	345	Algiers Obs., at Bouzaréah
6	Allegheny,* Pennsylvania	$+5^{\text{h}} 20^{\text{m}} 04.7^{\text{s}}$ a	$+40^{\circ} 28' 58.1''$	370	Obs. of the Univ. of Pittsburgh
7	Amherst,* Massachusetts ...	$+4^{\text{h}} 50^{\text{m}} 05.9^{\text{s}}$ a	$+42^{\circ} 21' 56''$	110	Amherst College Observatory
8	Ann Arbor, Michigan ...	$+5^{\text{h}} 34^{\text{m}} 55.27^{\text{s}}$ c	$+42^{\circ} 16' 48.7''$	282	Obs. of the Univ. of Michigan†
9	Ann Arbor, Michigan ...	$+5^{\text{h}} 34^{\text{m}} 57.4^{\text{s}}$	$+42^{\circ} 16' 32''$	250	Astr. Lab., Univ. of Michigan
10	Apia, Samoa ...	$+11^{\text{h}} 27^{\text{m}} 06^{\text{s}}$	$-13^{\circ} 48' 26''$	2	Apia Observatory
11	Appleton, Wisconsin ...	$+5^{\text{h}} 53^{\text{m}} 35.89^{\text{s}}$ a	$+44^{\circ} 15' 39.0''$	242	Underwood Obs., Lawrence Coll.
12	Arctetri (Florence*), Italy ...	$-0^{\text{h}} 45^{\text{m}} 01.30^{\text{s}}$ a	$+43^{\circ} 45' 14.4''$	184	Royal Astrophysical Obs.
13	Armagh, Northern Ireland	$+0^{\text{h}} 26^{\text{m}} 35.48^{\text{s}}$ b	$+54^{\circ} 21' 11''$	64	Armagh Observatory
14	Athens, Greece ...	$-1^{\text{h}} 34^{\text{m}} 52.06^{\text{s}}$ c	$+37^{\circ} 58' 19.7''$	110	National Observatory
15	Auckland, New Zealand ...	$-11^{\text{h}} 39^{\text{m}} 04.83^{\text{s}}$	$-36^{\circ} 54' 25''$	62	Observatory of R.A. McIntosh
16	Bâle, Switzerland ...	$-0^{\text{h}} 30^{\text{m}} 19.46^{\text{s}}$ a	$+47^{\circ} 33' 35.8''$	290	University Observatory
17	Bamberg, Germany ...	$-0^{\text{h}} 43^{\text{m}} 33.57^{\text{s}}$	$+49^{\circ} 53' 06.0''$	288	Remeis Observatory
18	Barcelona, Spain ...	$-0^{\text{h}} 08^{\text{m}} 30.2^{\text{s}}$	$+41^{\circ} 24' 59.3''$	415	Fabra Observatory
19	Beirut,† Syria ...	$-2^{\text{h}} 21^{\text{m}} 52.7^{\text{s}}$ a	$+33^{\circ} 54' 22''$	38	Obs. of the American Univ.
20	Belgrade,* Yugoslavia ...	$-1^{\text{h}} 22^{\text{m}} 03.8^{\text{s}}$	$+44^{\circ} 48' 08''$	250	University Observatory
21	Beloit, Wisconsin ...	$+5^{\text{h}} 56^{\text{m}} 07.4^{\text{s}}$ a	$+42^{\circ} 30' 08.4''$	245	Smith Obs., Beloit College
22	Berea, Ohio ...	$+5^{\text{h}} 27^{\text{m}} 24^{\text{s}}$	$+41^{\circ} 22' 30''$	—	Smith Obs., Baldwin-Wallace College
23	Bergedorf, Germany ...	$-0^{\text{h}} 40^{\text{m}} 57.74^{\text{s}}$ c	$+53^{\circ} 28' 46.9''$	41	Hamburg* Observatory
24	Berkeley, California ...	$+8^{\text{h}} 09^{\text{m}} 02.91^{\text{s}}$	$+37^{\circ} 52' 23.5''$	94	Students' Obs., Univ. of Calif.
25	Berlin*-Babelsberg, Germany	$-0^{\text{h}} 52^{\text{m}} 25.49^{\text{s}}$ a	$+52^{\circ} 24' 24.2''$	82	University Observatory
26	Berlin-Charlottenburg, Germany	$-0^{\text{h}} 53^{\text{m}} 20.5^{\text{s}}$ a	$+52^{\circ} 30' 48.7''$	60	Photographic Obs. of Technical High School
27	Berlin, Germany ...	$-0^{\text{h}} 53^{\text{m}} 27.40^{\text{s}}$ a	$+52^{\circ} 31' 30.7''$	47	University Obs. of Instruction§
28	Berlin, Germany ...	$-0^{\text{h}} 53^{\text{m}} 54.2^{\text{s}}$ a	$+52^{\circ} 29' 07''$	38	Treptow Observatory
29	Berne, Switzerland ...	$-0^{\text{h}} 29^{\text{m}} 43.1^{\text{s}}$	$+46^{\circ} 57' 13.6''$	550	Astr. Institute of the Univ.
30	Besançon, France ...	$-0^{\text{h}} 23^{\text{m}} 57.1^{\text{s}}$ c	$+47^{\circ} 14' 59''$	312	National Observatory
31	Bethlehem, Pennsylvania	$+5^{\text{h}} 01^{\text{m}} 31.96^{\text{s}}$	$+40^{\circ} 36' 23.2''$	128	Sayre Obs., Lehigh University
32	Birmingham, England ...	$+0^{\text{h}} 07^{\text{m}} 42.46^{\text{s}}$	$+52^{\circ} 26' 55.6''$	140	Obs. of Univ. of Birmingham
33	Blaca, Yugoslavia ...	$-1^{\text{h}} 06^{\text{m}} 08.0^{\text{s}}$	$+43^{\circ} 17' 37''$	280	Observatory of Nikola Milicević
34	Bloemfontein, South Africa	$-1^{\text{h}} 44^{\text{m}} 57^{\text{s}}$	$-29^{\circ} 05' 45''$	1490	Lamont-Hussey Observatory of the University of Michigan
35	Bloemfontein, South Africa	$-1^{\text{h}} 45^{\text{m}} 57^{\text{s}}$ a	$-29^{\circ} 12''$	1379	Boyden Station of Harvard Coll. Observatory, at Mazelspoort
36	Bloomington, Indiana ...	$+5^{\text{h}} 46^{\text{m}} 05^{\text{s}}$ a	$+39^{\circ} 09' 54''$	238	Kirkwood Obs., Univ. of Indiana
37	Bogota, Colombia ...	$+4^{\text{h}} 56^{\text{m}} 19.54^{\text{s}}$	$+4^{\circ} 35' 55.2''$	2640	National Astronomical Obs.
38	Bologna, Italy ...	$-0^{\text{h}} 45^{\text{m}} 24.48^{\text{s}}$ a	$+44^{\circ} 29' 52.4''$	84	Royal University Observatory
39	Bombay,|| India ...	$-4^{\text{h}} 51^{\text{m}} 15.60^{\text{s}}$	$+18^{\circ} 53' 36.2''$	19	Government Obs., at Colaba
40	Bonn, Germany ...	$-0^{\text{h}} 28^{\text{m}} 23.18^{\text{s}}$	$+50^{\circ} 43' 45.0''$	62	University Observatory

* See also List B. a Equatorial refractor. b Equatorial reflector. c Transit or meridian circle.

† Formerly (before 1931) Detroit Observatory. ‡ See also Ksara. § Urania Observatory, 1889-1913.

|| The geodetic co-ordinates are $-4^{\text{h}} 51^{\text{m}} 15^{\text{s}}.15$ and $+18^{\circ} 53' 46''.5$.

LIST A—ACTIVE OBSERVATORIES

No.	Natural Values of					Logarithms of				
	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{16} \times \rho \cos \phi'$	$\frac{8.80}{16} \times \rho \sin \phi'$	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{16} \times \rho \cos \phi'$	$\frac{8.80}{16} \times \rho \sin \phi'$
1	+0.82663	0.55864	+1.47970	0.328	+7.27	9.91731	9.74713	0.17017	9.516	0.862
2	+0.68332	0.72796	+0.93868	0.427	+6.01	9.83463	9.86211	9.97252	9.631	0.779
3*	-0.56931	0.82080	-0.69360	0.482	-5.01	9.75535 ⁿ	9.91424	9.84111 ⁿ	9.683	0.700 ⁿ
4	+0.67406	0.73661	+0.91508	0.432	+5.93	9.82870	9.86724	9.96146	9.636	0.773
5	+0.59577	0.80173	+0.74310	0.470	+5.24	9.77508	9.90403	9.87105	9.672	0.720
6	+0.64581	0.76173	+0.84782	0.447	+5.68	9.81010	9.88180	9.92831	9.650	0.755
7	+0.67036	0.74000	+0.90589	0.434	+5.90	9.82631	9.86923	9.95708	9.638	0.771
8	+0.66928	0.74102	+0.90319	0.435	+5.89	9.82561	9.86983	9.95578	9.638	0.770
9	+0.66922	0.74108	+0.90304	0.435	+5.89	9.82557	9.86986	9.95571	9.638	0.770
10	-0.23710	0.97129	-0.24411	0.570	-2.09	9.37493 ⁿ	9.98735	9.38758 ⁿ	9.756	0.319 ⁿ
11	+0.60440	0.71737	+0.96797	0.421	+6.11	9.84161	9.85575	9.98586	9.624	0.786
12	+0.68804	0.72350	+0.95099	0.424	+6.05	9.83761	9.85944	9.97818	9.628	0.782
13	+0.80897	0.58409	+1.38500	0.343	+7.12	9.90793	9.76648	0.14145	9.535	0.852
14*	+0.61192	0.78934	+0.77522	0.463	+5.38	9.78669	9.89726	9.88943	9.666	0.731
15	-0.59717	0.80062	-0.74589	0.470	-5.26	9.77610 ⁿ	9.90343	9.87267 ⁿ	9.672	0.721 ⁿ
16	+0.73440	0.67609	+1.08625	0.397	+6.46	9.86593	9.83000	0.03593	9.598	0.810
17	+0.76114	0.64562	+1.17893	0.379	+6.70	9.88147	9.80998	0.07149	9.578	0.826
18	+0.65809	0.75108	+0.87620	0.441	+5.79	9.81829	9.87568	9.94260	9.644	0.763
19	+0.55467	0.83083	+0.66761	0.487	+4.88	9.74403	9.91951	9.82452	9.688	0.689
20	+0.70112	0.71076	+0.98644	0.417	+6.17	9.84579	9.85172	9.99407	9.620	0.790
21	+0.67214	0.73841	+0.91025	0.433	+5.91	9.82746	9.86830	9.95916	9.637	0.772
22	+0.65751	0.75150	+0.87492	0.441	+5.79	9.81790	9.87593	9.94197	9.644	0.762
23	+0.79999	0.59641	+1.34134	0.350	+7.04	9.90308	9.77554	0.12754	9.544	0.848
24	+0.61057	0.79039	+0.77250	0.464	+5.37	9.78574	9.89784	9.88790	9.666	0.730
25	+0.78871	0.61135	+1.29011	0.359	+6.94	9.89692	9.78629	0.11063	9.555	0.841
26	+0.78984	0.60987	+1.29510	0.358	+6.95	9.89754	9.78524	0.11230	9.554	0.842
27	+0.78997	0.60971	+1.29564	0.358	+6.95	9.89761	9.78512	0.11249	9.554	0.842
28	+0.78954	0.61026	+1.29378	0.358	+6.95	9.89737	9.78552	0.11186	9.554	0.842
29	+0.72726	0.68388	+1.06344	0.401	+6.40	9.86169	9.83498	0.02671	9.603	0.806
30	+0.73074	0.68007	+1.07451	0.399	+6.43	9.86377	9.83255	0.03121	9.601	0.808
31	+0.64742	0.76030	+0.85154	0.446	+5.70	9.81119	9.88098	9.93020	9.649	0.756
32	+0.78917	0.61077	+1.29211	0.358	+6.94	9.89717	9.78587	0.11130	9.554	0.842
33	+0.68224	0.72903	+0.93582	0.428	+6.00	9.83394	9.86275	9.97119	9.631	0.778
34	-0.48350	0.87471	-0.55276	0.513	-4.25	9.68440 ⁿ	9.94186	9.74253 ⁿ	9.710	0.629 ⁿ
35	-0.48507	0.87381	-0.55512	0.513	-4.27	9.68581 ⁿ	9.94142	9.74439 ⁿ	9.710	0.630 ⁿ
36	+0.62818	0.77640	+0.80909	0.455	+5.53	9.79808	9.89009	9.90800	9.658	0.743
37	+0.07967	0.99721	+0.07989	0.585	+0.70	8.90130	9.99879	8.90252	9.767	9.846
38	+0.69733	0.71446	+0.97602	0.419	+6.14	9.84344	9.85398	9.98946	9.622	0.788
39	+0.32175	0.94646	+0.33995	0.555	+2.83	9.50751	9.97610	9.53141	9.744	0.452
40	+0.77052	0.63427	+1.21481	0.372	+6.78	9.88678	9.80228	0.08451	9.571	0.831

* The values given are for the position of the principal equatorial instrument.

LIST A—ACTIVE OBSERVATORIES

No.	Natural Values of					Logarithms of				
	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{18} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{18} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$
41	+0.70151	0.71033	+0.98758	0.417	+6.17	9.84604	9.85146	9.99457	9.620	0.791
42	+0.67015	0.74018	+0.90538	0.434	+5.90	9.82617	9.86934	9.95683	9.638	0.771
43	+0.77473	0.62910	+1.23148	0.369	+6.82	9.88915	9.79872	0.09043	9.567	0.834
44	-0.45856	0.88787	-0.51647	0.521	-4.04	9.66140 ⁿ	9.94835	9.71305 ⁿ	9.717	0.606 ⁿ
45	+0.69623	0.71555	+0.97301	0.420	+6.13	9.84276	9.85464	9.98812	9.623	0.787
46	+0.73371	0.67688	+1.08396	0.397	+6.46	9.86553	9.83051	0.03501	9.599	0.810
47	+0.73359	0.67693	+1.08371	0.397	+6.46	9.86545	9.83054	0.03491	9.599	0.810
48	+0.73344	0.67709	+1.08322	0.397	+6.45	9.86537	9.83065	0.03472	9.599	0.810
49	+0.78665	0.61400	+1.28119	0.360	+6.92	9.89578	9.78817	0.10761	9.557	0.840
50	+0.78664	0.61401	+1.28115	0.360	+6.92	9.89578	9.78818	0.10760	9.557	0.840
51	+0.67054	0.73983	+0.90635	0.434	+5.90	9.82642	9.86913	9.95729	9.638	0.771
52	-0.57505	0.81691	-0.70393	0.479	-5.06	9.75970 ⁿ	9.91217	9.84753 ⁿ	9.681	0.704 ⁿ
53	-0.55509	0.83054	-0.66834	0.487	-4.88	9.74436 ⁿ	9.91936	9.82500 ⁿ	9.688	0.689 ⁿ
54	-0.55523	0.83044	-0.66860	0.487	-4.89	9.74448 ⁿ	9.91931	9.82517 ⁿ	9.688	0.689 ⁿ
55	+0.18118	0.98350	+0.18421	0.577	+1.59	9.25810	9.99278	9.26532	9.761	0.203
56	+0.62776	0.77670	+0.80825	0.456	+5.52	9.79779	9.89025	9.90754	9.659	0.742
57	+0.60548	0.79431	+0.76227	0.466	+5.33	9.78210	9.89999	9.88211	9.668	0.727
58	+0.61279	0.78869	+0.77697	0.463	+5.39	9.78731	9.89691	9.89041	9.665	0.732
59	+0.62782	0.77669	+0.80833	0.456	+5.52	9.79784	9.89025	9.90759	9.659	0.742
60	+0.55738	0.82906	+0.67231	0.486	+4.90	9.74615	9.91858	9.82757	9.687	0.691
61	+0.65965	0.74967	+0.87992	0.440	+5.80	9.81931	9.87487	9.94444	9.643	0.764
62	+0.64212	0.76480	+0.83959	0.449	+5.65	9.80762	9.88355	9.92407	9.652	0.752
63	+0.11942	0.99280	+0.12029	0.582	+1.05	9.07708	9.99686	9.08022	9.765	0.022
64	+0.62509	0.77890	+0.80252	0.457	+5.50	9.79594	9.89148	9.90446	9.660	0.740
65	+0.63934	0.76717	+0.83338	0.450	+5.63	9.80573	9.88489	9.92084	9.653	0.750
66	+0.82231	0.56501	+1.45537	0.331	+7.24	9.91503	9.75206	0.16297	9.520	0.860
67	+0.82232	0.56499	+1.45547	0.331	+7.24	9.91504	9.75204	0.16300	9.520	0.860
68	-0.51833	0.85420	-0.60680	0.501	-4.56	9.71460 ⁿ	9.93156	9.78304 ⁿ	9.700	0.659 ⁿ
69	+0.63268	0.77269	+0.81879	0.453	+5.57	9.80118	9.88801	9.91317	9.656	0.746
70	+0.76315	0.64322	+1.18645	0.377	+6.72	9.88261	9.80836	0.07425	9.577	0.827
71	+0.80898	0.58406	+1.38510	0.343	+7.12	9.90794	9.76646	0.14148	9.535	0.852
72	+0.80938	0.58349	+1.38714	0.342	+7.12	9.90815	9.76603	0.14212	9.534	0.853
73	+0.73407	0.67641	+1.08524	0.397	+6.46	9.86574	9.83021	0.03553	9.599	0.810
74	+0.78381	0.61764	+1.26904	0.362	+6.90	9.89421	9.79074	0.10348	9.559	0.839
75	+0.50184	0.86410	+0.58076	0.507	+4.42	9.70056	9.93656	9.76400	9.705	0.645
76	+0.64272	0.76433	+0.84090	0.448	+5.66	9.80802	9.88328	9.92475	9.652	0.753
77	+0.63520	0.77091	+0.82396	0.452	+5.59	9.80291	9.88701	9.91590	9.655	0.747
78	+0.66040	0.74901	+0.88170	0.439	+5.81	9.81981	9.87449	9.94532	9.643	0.764
79	+0.77385	0.63021	+1.22793	0.370	+6.81	9.88866	9.79948	0.08917	9.568	0.833
80	+0.79903	0.59771	+1.33681	0.351	+7.03	9.90256	9.77649	0.12607	9.545	0.847

OBSERVATORIES, 1935

LIST A—ACTIVE OBSERVATORIES

No.	Place	Longitude	Latitude	Altitude	Description
81	Dunedin, New Zealand ...	$-11^{\circ} 21' 58.05^{\circ}$ ^b	$-45^{\circ} 52' 25.9''$	200 ^m	Observatory of Otago Institute
82	Durban,* South Africa ...	$-2^{\circ} 04' 01.18''$	$-29^{\circ} 50' 47''$	79	Obs. of Natal Technical College
83	Durham, England ...	$+0^{\circ} 06' 19.75''$	$+54^{\circ} 46' 06.2''$	108	University Observatory
84	Düsseldorf, Germany ...	$+0^{\circ} 27' 02.69^{\circ}$ ^a	$+51^{\circ} 12' 25''$	46	Municipal Observatory
85	Edinburgh,* Scotland ...	$+0^{\circ} 12' 44.10^{\circ}$	$+55^{\circ} 55' 30''$	146	Royal Observatory
86	Elmira, New York ...	$+5^{\circ} 07' 13.9''$	$+42^{\circ} 06' 25''$	—	Elmira College Observatory
87	Evanston,† Illinois ...	$+5^{\circ} 50' 42.3''$	$+42^{\circ} 03' 33.4''$	175	Dearborn Obs., Northwestern University
88	Ewhurst (Surrey), England ...	$+0^{\circ} 01' 47''$	$+51^{\circ} 10' 09''$	191	Observatory of J. Evershed
89	Faenza, Italy ...	$-0^{\circ} 47' 33.9''$	$+44^{\circ} 17' 02''$	45	Urania Lamonia Observatory
90	Payette, Missouri ...	$+6^{\circ} 11' 18.1''$	$+39^{\circ} 16' 16.8''$	745	Morrison Obs., Central College
91	Flagstaff, Arizona ...	$+7^{\circ} 26' 44.6''$	$+35^{\circ} 12' 30.5''$	2210	Lowell Observatory
92	Florence,* Italy ...	$-0^{\circ} 45' 02.66''$	$+43^{\circ} 46' 49.4''$	72	Military Geographical Institute
93	Frankfurt am Main, Germany ...	$-0^{\circ} 34' 36.3''$ ^c	$+50^{\circ} 07' 00''$	121	University Observatory
94	Frederick, Maryland ...	$+5^{\circ} 09' 40''$	$+39^{\circ} 25' 21''$	99	Williams Obs., Hood College
95	Geneva, New York ...	$+5^{\circ} 08' 01''$	$+42^{\circ} 52' 46.2''$	152	Smith Observatory
96	Geneva, Switzerland ...	$-0^{\circ} 24' 36.53^{\circ}$	$+46^{\circ} 11' 59.3''$	406	Geneva Observatory
97	Genoa, Italy ...	$-0^{\circ} 35' 41.28^{\circ}$	$+44^{\circ} 25' 08.1''$	108	Royal Marine Hydrographic Institute
98	Glasgow, Scotland ...	$+0^{\circ} 17' 10.55^{\circ}$	$+55^{\circ} 52' 42.1''$	55	University Observatory
99	Gotha,* Germany ...	$-0^{\circ} 42' 50.51^{\circ}$ ^a	$+50^{\circ} 56' 37.9''$	322	Ducal Observatory
100	Göttingen, Germany ...	$-0^{\circ} 39' 46.22^{\circ}$	$+51^{\circ} 31' 48.1''$	161	University Observatory
101	Granada, Spain ...	$+0^{\circ} 14' 22.13^{\circ}$ ^a	$+37^{\circ} 11' 13''$	775	Cartuja Observatory
102	Graz, Austria ...	$-1^{\circ} 01' 47.71^{\circ}$ ^a	$+47^{\circ} 04' 37.2''$	375	University Observatory
103	Greencastle, Indiana ...	$+5^{\circ} 47' 24.36''$	$+39^{\circ} 38' 46.6''$	262	McKim Obs., De Pauw Univ.
104	Greenwich, England ...	$00^{\circ} 00.00^{\circ}$	$+51^{\circ} 28' 38.2''$	47	Royal Observatory
105	Groningen, Holland ...	$-0^{\circ} 26' 15.11''$	$+53^{\circ} 13' 13.8''$	—	Kapteyn Astr. Laboratory
106	Grove Park (London), England ...	$-0^{\circ} 00' 06.1''$	$+51^{\circ} 25' 53.1''$	41	Observatory of F. Addey
107	Hamburg,*† Germany ...	$-0^{\circ} 39' 53.42''$	$+53^{\circ} 32' 51.8''$	30	Marine Observatory
108	Hanover, New Hampshire ...	$+4^{\circ} 49' 08''$	$+43^{\circ} 42' 15.3''$	183	Shattuck Obs., Dartmouth Coll.
109	Haverford, Pennsylvania ...	$+5^{\circ} 01' 12.7''$	$+40^{\circ} 00' 40.1''$	116	Haverford College Observatory
110	Headley (Surrey), England ...	$+0^{\circ} 01' 04.15^{\circ}$ ^a	$+51^{\circ} 16' 32.2''$	174	Observatory of T. E. R. Phillips
111	Heidelberg,*§ Germany ...	$-0^{\circ} 34' 52.95''$	$+49^{\circ} 23' 55.7''$	570	Baden Obs., at Königstuhl
112	Helsingfors, Finland ...	$-1^{\circ} 39' 49.10^{\circ}$	$+60^{\circ} 09' 42.3''$	33	University Observatory||
113	Helwan, Egypt ...	$-2^{\circ} 05' 21.87''$	$+29^{\circ} 51' 31.1''$	115	Helwan Observatory
114	Hem (Nord), France ...	$-0^{\circ} 12' 44.47''$	$+50^{\circ} 39' 37''$	53	Obs. of the Univ. of Lille
115	Herrsching, Germany ...	$-0^{\circ} 44' 43.6''$	$+47^{\circ} 59' 55''$	534	Observatory of Dr. Strebel
116	Hong Kong, China ...	$-7^{\circ} 36' 41.19^{\circ}$	$+22^{\circ} 18' 13.2''$	33	Royal Observatory
117	Hudson, Ohio ...	$+5^{\circ} 25' 44.2''$	$+41^{\circ} 14' 43''$	—	Obs. of Western Reserve Acad.
118	Hyderabad, India ...	$-5^{\circ} 13' 48.98''$	$+17^{\circ} 25' 54.3''$	554	Nizamiah Observatory
119	Innsbruck, Austria ...	$-0^{\circ} 45' 31.42''$	$+47^{\circ} 16' 07.7''$	605	University Observatory
120	Iowa City, Iowa ...	$+6^{\circ} 06' 08''$	$+41^{\circ} 39' 44''$	221	Obs. of University of Iowa

* See also List B. ^a Equatorial refractor. ^b Equatorial reflector. ^c Transit or meridian circle.

† Transferred from Chicago* in 1888. † See also Bergedorf.

§ At Schwetzingen 1762-1775, at Mannheim* 1775-1880, at Karlsruhe* 1880-1896.

|| Formerly at Abo*.

OBSERVATORIES, 1935

687

LIST A—ACTIVE OBSERVATORIES

No.	Natural Values of					Logarithms of				
	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{15} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{15} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$
81	-0.71424	0.69747	-1.02405	0.409	-6.29	9.85385 ⁿ	9.84353	0.01032 ⁿ	9.612	0.798 ⁿ
82	-0.49475	0.86810	-0.56992	0.509	-4.35	9.69438 ⁿ	9.93857	9.75582 ⁿ	9.707	0.639 ⁿ
83	+0.81318	0.57819	+1.40641	0.339	+7.16	9.91018	9.76207	0.14811	9.530	0.855
84	+0.77577	0.62780	+1.23569	0.368	+6.83	9.88973	9.79782	0.09191	9.566	0.834
85	+0.82466	0.56159	+1.46844	0.329	+7.26	9.91627	9.74942	0.16686	9.518	0.861
86	+0.66702	0.74302	+0.89771	0.436	+5.87	9.82414	9.87100	9.95314	9.639	0.769
87	+0.66642	0.74359	+0.89621	0.436	+5.86	9.82375	9.87134	9.95241	9.640	0.768
88	+0.77537	0.62833	+1.23403	0.369	+6.82	9.88951	9.79818	0.09132	9.567	0.834
89	+0.69466	0.71707	+0.96875	0.421	+6.11	9.84178	9.85556	9.98621	9.624	0.786
90	+0.62966	0.77529	+0.81216	0.455	+5.54	9.79911	9.88947	9.90964	9.658	0.744
91	+0.57352	0.81826	+0.70090	0.480	+5.05	9.75855	9.91289	9.84566	9.681	0.703
92	+0.68836	0.72317	+0.95187	0.424	+6.06	9.83782	9.85924	9.97858	9.628	0.782
93	+0.76372	0.64251	+1.18865	0.377	+6.72	9.88293	9.80788	0.07505	9.576	0.827
94	+0.63163	0.77355	+0.81654	0.454	+5.56	9.80046	9.88849	9.91198	9.657	0.745
95	+0.67695	0.73395	+0.92235	0.431	+5.96	9.83056	9.86566	9.96490	9.634	0.775
96	+0.71821	0.69340	+1.03577	0.407	+6.32	9.85625	9.84099	0.01526	9.609	0.801
97	+0.69635	0.71543	+0.97333	0.420	+6.13	9.84283	9.85457	9.98826	9.623	0.787
98	+0.82419	0.56225	+1.46587	0.330	+7.25	9.91603	9.74993	0.16610	9.518	0.861
99	+0.77292	0.63139	+1.22414	0.370	+6.80	9.88813	9.80030	0.08783	9.569	0.833
100	+0.77930	0.62341	+1.25007	0.366	+6.86	9.89170	9.79477	0.09693	9.563	0.836
101	+0.60117	0.79774	+0.75358	0.468	+5.29	9.77899	9.90186	9.87713	9.670	0.723
102	+0.72870	0.68229	+1.06803	0.400	+6.41	9.86255	9.83397	0.02859	9.602	0.807
103	+0.63465	0.77109	+0.82306	0.452	+5.58	9.80254	9.88710	9.91543	9.655	0.747
104	+0.77871	0.62411	+1.24770	0.366	+6.85	9.89138	9.79526	0.09611	9.564	0.836
105	†	—	—	—	—	—	—	—	—	—
106	+0.77821	0.62474	+1.24566	0.367	+6.85	9.89110	9.79570	0.09540	9.564	0.836
107	+0.80069	0.59545	+1.34468	0.349	+7.05	9.90347	9.77485	0.12862	9.543	0.848
108	+0.68742	0.72410	+0.94934	0.425	+6.05	9.83722	9.85980	9.97742	9.628	0.782
109	+0.63952	0.76700	+0.83379	0.450	+5.63	9.80585	9.88480	9.92106	9.653	0.750
110	+0.77653	0.62688	+1.23873	0.368	+6.83	9.89016	9.79718	0.09298	9.566	0.835
111	+0.75569	0.65211	+1.15883	0.383	+6.65	9.87834	9.81432	0.06402	9.583	0.823
112	+0.86379	0.49882	+1.73168	0.293	+7.60	9.93641	9.69794	0.23847	9.466	0.881
113	+0.49494	0.86800	+0.57021	0.509	+4.36	9.69455	9.93852	9.75603	9.707	0.639
114	+0.76976	0.63520	+1.21183	0.373	+6.77	9.88635	9.80291	0.08344	9.571	0.831
115	+0.73957	0.67045	+1.10309	0.393	+6.51	9.86898	9.82637	0.04261	9.595	0.813
116	+0.37715	0.92564	+0.40745	0.543	+3.32	9.57651	9.96644	9.61007	9.735	0.521
117	+0.65581	0.75300	+0.87094	0.442	+5.77	9.81678	9.87679	9.93999	9.645	0.761
118	+0.29767	0.95445	+0.31188	0.560	+2.62	9.47374	9.97975	9.49399	9.748	0.418
119	+0.73100	0.67986	+1.07523	0.399	+6.43	9.86392	9.83242	0.03150	9.601	0.808
120	+0.66128	0.74821	+0.88380	0.439	+5.82	9.82038	9.87403	9.94636	9.642	0.765

† No telescopic equipment.

OBSERVATORIES, 1935

LIST A—ACTIVE OBSERVATORIES

No.	Place	Longitude	Latitude	Altitude	Description
121	Ithaca, * New York ...	+ 5 05 54.3 ^b	+42 27 10.4 ^m	270 ^m	Fuertes Obs., Cornell Univ.
122	Jassy, Romania ...	- 1 50 28	+47 11 28	128	University Observatory
123	Jena, * Germany ...	- 0 46 20.22a	+50 55 34.8	164	University Observatory
124	Johannesburg, South Africa	- 1 52 17.9 a	-26 10 52.1	1786	Union Observatory†
125	Johannesburg, South Africa	- 1 52 07 a	-26 11 14	1741	Branch of Yale University Obs.
126	Juvisy, France ...	- 0 09 29.0	+48 41 37	92	M. Flammarion's Observatory
127	Kalocsa, Hungary ...	- 1 15 54.34	+46 31 42.4	102	Haynald Observatory
128	Kasan, Russia ...	- 3 15 15.74c	+55 50 20.5	98	Engelhardt Observatory‡
129	Kasan, Russia ...	- 3 16 29.03a	+55 47 24.3	79	University Observatory
130	Kharkov (Ukraine), Russia	- 2 24 55.72c	+50 00 09.9	139	Kharkov Observatory
131	Kiel, Germany ...	- 0 40 35.45c	+54 20 27.6	52	University Observatory§
132	Kiev (Ukraine), Russia ...	- 2 02 00.45 a	+50 27 10.0	184	Astronomical Observatory
133	Kingswood (Surrey), Eng.	+ 0 00 50.25b	+51 17 34.1	157	Obs. of F. J. Hargreaves
134	Kitab, Ouzbekistan ...	- 4 27 31.7	+39 08 01.6	658	International Latitude Obs.
135	Kodaikanal, India ...	- 5 09 52.0	+10 13 50	2343	Solar Physics Observatory
136	Königsberg, Germany ...	- 1 21 58.98	+54 42 50.6	22	University Observatory
137	Konstanz, Germany ...	- 0 36 42.01	+47 39 43.6	420	Observatory of E. Leiner
138	Kremsmünster, Austria ...	- 0 56 32.03	+48 03 30.2	382	Obs. of the Benedictines
139	Ksara, Syria ...	- 2 23 33.77	+33 49 25.6	923	Ksara Observatory||
140	Kyoto, * Japan ...	- 9 03 10.24	+34 59 40.3	222	Kwasan Obs. of Kyoto Imperial University
141	Lake Angelus, Michigan ...	+ 5 33 16	+42 41 50	296	McMath-Hulbert Obs.¶
142	Landstuhl, Germany ...	- 0 30 16.32	+49 24 42.9	380	Observatory of P. Fauth
143	La Paz, Bolivia ...	+ 4 32 31.85	-16 29 43	3659	Obs. of College of San Calixto
144	La Plata, Argentina ...	+ 3 51 43.72c	-34 54 30.3	17	National University Obs.
145	Lawrence, Kansas ...	+ 6 20 00.2 c	+38 57 30	—	Obs. of University of Kansas
146	Leiden, * Holland ...	- 0 17 56.15c	+52 09 19.8	6	University Observatory
147	Leipzig, * Germany ...	- 0 49 33.93a	+51 20 05.9	119	University Observatory
148	Leiston (Suffolk), England	- 0 06 19.03	+52 11 58.3	18	Observatory of A. F. Bennett††
149	Lembang, Java ...	- 7 10 27.84	- 6 49 32.9	1300	Bosscha Observatory
150	Lemberg, Poland ...	- 1 36 08	+49 49 57.6	330	Astr. Institute of the Univ.
151	Lemberg, Poland ...	- 1 36 03.40	+49 50 11.2	340	Obs. of Polytechnical College
152	Leningrad, Russia ...	- 2 01 10.82	+59 56 32.2	3	University Observatory
153	Leonia, New Jersey ...	+ 4 55 57.3	+40 51 50.5	49	Obs. of J. Ernest G. Yalden
154	Liège, Belgium ...	- 0 22 15.42	+50 37 06	127	University Obs., at Cointe
155	Lisbon (Tapada), Portugal	+ 0 36 44.68a	+38 42 30.5	95	Lisbon Observatory
156	Liverpool, * England ...	+ 0 12 17.33	+53 24 04.8	62	Liverpool Obs., at Bidston
157	London, England ...	+ 0 00 31.8	+51 31 28	—	Student's Obs., Univ. of London
158	Lourenço Marques, Portuguese East Africa	- 2 10 22.63	-25 58 05.5	60	Campos Rodrigues Observatory
159	Lovedale, South Africa ...	- 1 47 25	-32 46 30	52	Observatory of A. W. Roberts
160	Lund, Sweden ...	- 0 52 44.97	+55 41 51.6	34	Royal University Observatory

* See also List B. a Equatorial refractor. b Equatorial reflector. c Transit or meridian circle.

† Formerly Transvaal Observatory. ‡ Formerly at Dresden.* § Formerly at Altona.*

¶ At Saâd-Nail, near Beirut.

|| Branch of the Observatory of the University of Michigan at Ann Arbor.

†† Moved to this position in 1933.

LIST A—ACTIVE OBSERVATORIES

No.	Natural Values of					Logarithms of				
	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{15} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{15} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$
121	+0.67150	0.73900	+0.90867	0.434	+5.91	9.82705	9.86864	9.95841	9.637	0.772
122	+0.73003	0.68080	+1.07231	0.399	+6.42	9.86334	9.83302	0.03032	9.601	0.808
123	+0.77271	0.63161	+1.22339	0.371	+6.80	9.88801	9.80045	0.08756	9.569	0.832
124	-0.43865	0.89824	-0.48835	0.527	-3.86	9.64212 ⁿ	9.95339	9.68873 ⁿ	9.722	0.587 ⁿ
125	-0.43875	0.89819	-0.48848	0.527	-3.86	9.64221 ⁿ	9.95337	9.68885 ⁿ	9.722	0.587 ⁿ
126	+0.74757	0.66135	+1.13037	0.388	+6.58	9.87365	9.82043	0.05322	9.589	0.818
127	+0.72213	0.68923	+1.04774	0.404	+6.35	9.85861	9.83836	0.02025	9.607	0.803
128	+0.82381	0.56283	+1.46371	0.330	+7.25	9.91583	9.75037	0.16545	9.519	0.860
129	+0.82333	0.56353	+1.46102	0.331	+7.25	9.91557	9.75092	0.16466	9.519	0.860
130	+0.76245	0.64404	+1.18386	0.378	+6.71	9.88221	9.86891	0.07330	9.577	0.827
131	+0.80884	0.58426	+1.38438	0.343	+7.12	9.90786	9.76661	0.14126	9.535	0.852
132	+0.76747	0.63801	+1.20292	0.374	+6.75	9.88506	9.80483	0.08024	9.573	0.830
133	+0.77672	0.62664	+1.23949	0.368	+6.84	9.89026	9.79702	0.09324	9.565	0.835
134	+0.62780	0.77680	+0.80819	0.456	+5.52	9.79782	9.89031	9.90751	9.659	0.742
135	+0.17650	0.98457	+0.17927	0.578	+1.55	9.24674	9.99325	9.25350	9.762	0.191
136	+0.81262	0.57896	+1.40359	0.340	+7.15	9.90989	9.76265	0.14724	9.531	0.854
137	+0.73562	0.67479	+1.09015	0.396	+6.47	9.86665	9.82917	0.03749	9.598	0.811
138	+0.74025	0.66960	+1.10541	0.393	+6.51	9.86938	9.82585	0.04352	9.594	0.814
139	+0.55356	0.83174	+0.66554	0.488	+4.87	9.74316	9.91999	9.82317	9.688	0.688
140	+0.57029	0.82014	+0.69530	0.481	+5.02	9.75610	9.91389	9.84221	9.682	0.701
141	+0.67464	0.73512	+0.91648	0.432	+5.94	9.82907	9.86695	9.96212	9.635	0.774
142	+0.75581	0.65192	+1.15937	0.382	+6.65	9.87841	9.81419	0.06422	9.583	0.823
143	-0.28227	0.95965	-0.29413	0.563	-2.48	9.45066 ⁿ	9.98211	9.46855 ⁿ	9.751	0.395 ⁿ
144	-0.56905	0.82097	-0.69314	0.482	-5.01	9.75515 ⁿ	9.91433	9.84082 ⁿ	9.683	0.700 ⁿ
145	+0.62536	0.77864	+0.80314	0.457	+5.50	9.79613	9.89134	9.90479	9.660	0.741
146	+0.78602	0.61481	+1.27847	0.361	+6.92	9.89543	9.78874	0.10669	9.557	0.840
147	+0.77717	0.62606	+1.24136	0.367	+6.84	9.89052	9.79662	0.09390	9.565	0.835
148	+0.78650	0.61419	+1.28055	0.360	+6.92	9.89570	9.78830	0.10740	9.557	0.840
149	-0.11808	0.99316	-0.11890	0.583	-1.04	9.07218 ⁿ	9.99702	9.07516 ⁿ	9.765	0.017 ⁿ
150	+0.76056	0.64633	+1.17675	0.379	+6.69	9.88113	9.81045	0.07068	9.579	0.826
151	+0.76060	0.64628	+1.17690	0.379	+6.69	9.88116	9.81042	0.07074	9.579	0.826
152	+0.86188	0.50214	+1.71641	0.295	+7.58	9.93544	9.70082	0.23462	9.469	0.880
153	+0.65081	0.75736	+0.85931	0.444	+5.73	9.81345	9.87930	9.93415	9.648	0.758
154	+0.76930	0.63577	+1.21003	0.373	+6.77	9.88610	9.80330	0.08279	9.572	0.831
155	+0.62198	0.78138	+0.79601	0.458	+5.47	9.79378	9.89286	9.90092	9.661	0.738
156	+0.79918	0.59751	+1.33751	0.351	+7.03	9.90264	9.77634	0.12630	9.545	0.847
157	+0.77922	0.62347	+1.24982	0.366	+6.80	9.89166	9.79481	0.09685	9.563	0.836
158	-0.43521	0.89963	-0.48377	0.528	-3.83	9.63870 ⁿ	9.95406	9.68464 ⁿ	9.722	0.583 ⁿ
159	-0.53824	0.84164	-0.63951	0.494	-4.74	9.73097 ⁿ	9.92513	9.80585 ⁿ	9.694	0.675 ⁿ
160	+0.82241	0.56486	+1.45596	0.331	+7.24	9.91509	9.75194	0.16315	9.520	0.860

OBSERVATORIES, 1935

691

LIST A—ACTIVE OBSERVATORIES

No.	Natural Values of					Logarithms of				
	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{15} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{15} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$
161	+0.71208	0.69972	+1.01766	0.411	+6.27	9.85253	9.84492	0.00760	9.613	0.797
162	+0.67949	0.73162	+0.92874	0.429	+5.98	9.83218	9.86429	9.96789	9.633	0.777
163	+0.22464	0.97427	+0.23057	0.572	+1.98	9.35149	9.98868	9.36281	9.757	0.296
164	+0.64485	0.76260	+0.84560	0.447	+5.67	9.80946	9.88230	9.92716	9.651	0.754
165	+0.30734	0.95137	+0.32306	0.558	+2.70	9.48763	9.97835	9.50928	9.747	0.432
166	+0.25006	0.96801	+0.25832	0.568	+2.20	9.39804	9.98588	9.41216	9.754	0.343
167	+0.61366	0.78796	+0.77880	0.462	+5.40	9.78793	9.89650	9.89142	9.665	0.732
168	+0.68235	0.72888	+0.93616	0.428	+6.00	9.83401	9.86266	9.97135	9.631	0.778
169	-0.34139	0.93951	-0.36337	0.551	-3.00	9.53325 ^m	9.97290	9.56035 ^m	9.741	0.478 ^m
170	-0.60999	0.79082	-0.77134	0.464	-5.37	9.78532 ^m	9.89808	9.88725 ^m	9.666	0.730 ^m
171	+0.71213	0.69968	+1.01779	0.410	+6.27	9.85256	9.84490	0.00766	9.613	0.797
172	+0.74886	0.65990	+1.13481	0.387	+6.59	9.87440	9.81948	0.05492	9.588	0.819
173	+0.65986	0.74944	+0.88048	0.440	+5.81	9.81945	9.87474	9.94472	9.643	0.764
174	+0.70927	0.70254	+1.00958	0.412	+6.24	9.85081	9.84667	0.00414	9.615	0.795
175	+0.78019	0.62227	+1.25378	0.365	+6.87	9.89220	9.79398	0.09822	9.562	0.837
176	+0.70329	0.70860	+0.99251	0.416	+6.19	9.84714	9.85040	9.99673	9.619	0.792
177	+0.62774	0.77672	+0.80820	0.456	+5.52	9.79778	9.89026	9.90752	9.659	0.742
178	+0.71429	0.69835	+1.02283	0.410	+6.29	9.85388	9.84408	0.00980	9.612	0.798
179	-0.56906	0.82097	-0.69316	0.482	-5.01	9.75516 ^m	9.91433	9.84083 ^m	9.683	0.700 ^m
180	-0.38261	0.92387	-0.41414	0.542	-3.37	9.58276 ^m	9.96561	9.61715 ^m	9.734	0.527 ^m
181	+0.70974	0.70205	+1.01096	0.412	+6.25	9.85110	9.84637	0.00474	9.615	0.796
182	+0.77238	0.63201	+1.22210	0.371	+6.80	9.88783	9.80072	0.08711	9.569	0.832
183	+0.82305	0.56391	+1.45953	0.331	+7.24	9.91543	9.75121	0.16421	9.520	0.860
184	+0.82300	0.56404	+1.45913	0.331	+7.24	9.91540	9.75131	0.16409	9.520	0.860
185	-0.43373	0.90061	-0.48160	0.528	-3.82	9.63722 ^m	9.95454	9.68268 ^m	9.723	0.582 ^m
186	+0.60334	0.79619	+0.75778	0.467	+5.31	9.78056	9.90102	9.87955	9.669	0.725
187	+0.56037	0.82716	+0.67746	0.485	+4.93	9.74847	9.91759	9.83088	9.686	0.693
188	+0.75990	0.64724	+1.17406	0.380	+6.69	9.88076	9.81107	0.06969	9.579	0.825
189	+0.55929	0.82802	+0.67545	0.486	+4.92	9.74764	9.91804	9.82959	9.686	0.692
190	+0.74129	0.66854	+1.10882	0.392	+6.52	9.86999	9.82513	0.04486	9.594	0.814
191	+0.78396	0.61747	+1.26963	0.362	+6.90	9.89429	9.79062	0.10368	9.559	0.839
192	+0.77991	0.62262	+1.25262	0.365	+6.86	9.89204	9.79422	0.09782	9.563	0.837
193	+0.65627	0.75259	+0.87202	0.442	+5.78	9.81709	9.87656	9.94053	9.645	0.762
194	+0.65080	0.75739	+0.85928	0.444	+5.73	9.81345	9.87932	9.93413	9.648	0.758
195	+0.58663	0.80845	+0.72562	0.474	+5.16	9.76836	9.90765	9.86071	9.676	0.713
196*	+0.72777	0.68332	+1.06505	0.401	+6.40	9.86199	9.83462	0.02737	9.603	0.806
197	+0.64601	0.76148	+0.84835	0.447	+5.68	9.81024	9.88166	9.92858	9.650	0.755
198	+0.65683	0.75211	+0.87332	0.441	+5.78	9.81745	9.87628	9.94117	9.645	0.762
199	-0.62677	0.77750	-0.80614	0.456	-5.52	9.79711 ^m	9.89070	9.90641 ^m	9.659	0.742 ^m
200	+0.68765	0.72392	+0.94991	0.425	+6.05	9.83737	9.85969	9.97768	9.628	0.782

* The values given are for the position of the principal equatorial instrument.

OBSERVATORIES, 1935

LIST A—ACTIVE OBSERVATORIES

No.	Place	Longitude	Latitude	Altitude	Description
201	Nikolaieff (Ukraine), Russia	- 2 07 53.98 ^c	+46 56 19.3	55 ^m	Astronomical Observatory†
202	Northampton, Mass. ...	+ 4 50 33.10	+42 19 01.9	61	Smith College Observatory
203	Northfield, Minnesota ...	+ 6 12 35.94 ^a	+44 27 41.4	290	Goodsell Obs., Carleton College
204	Oakland, California ...	+ 8 08 48	+37 47	99	Chabot Observatory
205	Oak Ridge, Massachusetts	+ 4 46 14.2	+42 30 13	183	Branch of Harvard Coll. Obs.
206	Odessa, Russia ...	- 2 03 02.15	+46 28 36.0	55	Astronomical Observatory
207	Omaha, Nebraska ...	+ 6 23 46.96	+41 16 05.6	344	Creighton University Obs.
208	Ondřejov, Czechoslovakia	- 0 59 08	+49 54 38	527	Observatory of J. and J. Frič
209	Orono, Maine ...	+ 4 34 40.3	+44 54 00	40	Obs. of University of Maine
210	Oslo, † Norway ...	- 0 42 53.5 ^c	+59 54 43.7	25	University Observatory
211	Ottawa, Canada ...	+ 5 02 51.95 ^c	+45 23 38.1	87	Dominion Observatory
212	Oxford, England ...	+ 0 05 00.4	+51 45 34.2	64	University Observatory
213	Oxford, England ...	+ 0 05 03.0 ^c	+51 45 35.6	65	Radcliffe Observatory
214	Oxford, Mississippi ...	+ 5 58 07.18	+34 22 12.6	140	Obs. of Univ. of Mississippi
215	Padua, Italy ...	- 0 47 29.15	+45 24 01.2	38	Royal University Observatory
216	Paisley, Scotland ...	+ 0 17 43.3	+55 50 43.8	33	Coats Observatory
217	Palermo, Sicily ...	- 0 53 25.87	+38 06 43.6	72	Royal Observatory
218	Paris, France ...	- 0 09 20.91 [§]	+48 50 11	67	Observatory of Paris
219	Paris, France ...	- 0 09 22.0	+48 51 10.5	57	Obs. of the Astr. Soc. of France
220	Peking, China ...	- 7 45 52.87	+39 54 23.0	—	Central Observatory
221	Perm, Russia ...	- 3 45 00	+58 01	150	Obs. of State University
222	Perth, Western Australia	- 7 43 21.62 ^a	-31 57 10.7	60	Government Observatory
223	Philadelphia, Pennsylvania	+ 5 01 06.88 ^a	+39 58 02.1	74	Flower Observatory, University of Pennsylvania
224	Philadelphia, Pennsylvania	+ 5 00 38.5	+39 57 07.5	—	Obs. of Central High School
225	Pic du Midi, France ...	- 0 00 34.29	+42 56 31.5	2850	Branch of Toulouse Univ. Obs.
226	Porto Alegre, Brazil ...	+ 3 24 53.24	-30 01 50	26	Astr. and Meteorological Inst.
227	Posen, Poland ...	- 1 07 30.94	+52 23 47.7	85	University Observatory
228	Potsdam, Germany ...	- 0 52 15.86	+52 22 56.0	97	Astrophysical Observatory
229	Potsdam, Germany ...	- 0 52 16.11	+52 22 54.8	99	Geodetic Institute
230	Poughkeepsie, New York ...	+ 4 55 33.6 ^a	+41 41 18	61	Vassar College Observatory
231	Prague, Czechoslovakia ...	- 0 57 40.28	+50 05 15.8	197	National Observatory
232	Prague, Czechoslovakia ...	- 0 57 40.3	+50 05 16	200	Obs. of the German University
233	Prague - Smichov, Czechoslovakia	- 0 57 35.1	+50 04 36.0	267	Astronomical Institute of the Charles University
234	Princeton, New Jersey ...	+ 4 58 39.44 ^a	+40 20 55.8	75	Halsted Obs., Princeton Univ.
235	Princeton, New Jersey ...	+ 4 58 37.64 ^a	+40 20 57.4	65	Obs. of Instruction, Princeton University
236	Providence, Rhode Island	+ 4 45 35.95	+41 50 15.6	69	Ladd Obs., Brown University
237	Providence, Rhode Island	+ 4 45 37.64	+41 49 46.4	171	Observatory of F. E. Seagrave
238	Pulkovo, Russia ...	- 2 01 18.57	+59 46 18.5	75	Pulkovo Observatory
239	Quebec, Canada ...	+ 4 44 52.71	+46 47 59.2	90	Quebec Obs., Plains of Abraham
240	Riga, Latvia ...	- 1 36 27.73	+56 57 08	—	Obs. of the Latvian University

* See also List B. a Equatorial refractor. b Equatorial reflector. c Transit or meridian circle.

† 1823-1912, Naval Observatory; 1912-1926, branch of Pulkovo Observatory.

‡ Before 1925, Christiana. § Cassini's meridian.

LIST A—ACTIVE OBSERVATORIES

No.	Natural Values of					Logarithms of				
	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{18} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{18} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$
201	+0.72742	0.68359	+1.06412	0.401	+6.40	9.86179	9.83480	0.02699	9.603	0.806
202	+0.66974	0.74057	+0.90436	0.434	+5.89	9.82590	9.86956	9.95634	9.638	0.770
203	+0.69690	0.71493	+0.97478	0.419	+6.13	9.84317	9.85427	9.98891	9.623	0.788
204	+0.60934	0.79134	+0.77000	0.464	+5.36	9.78486	9.89837	9.88649	9.667	0.729
205	+0.67215	0.73839	+0.91029	0.433	+5.91	9.82746	9.86829	9.95918	9.637	0.772
206	+0.72150	0.68988	+1.04584	0.405	+6.35	9.85824	9.83877	0.01947	9.607	0.803
207	+0.65615	0.75277	+0.87164	0.442	+5.77	9.81700	9.87666	9.94034	9.645	0.761
208	+0.76146	0.64531	+1.18000	0.379	+6.70	9.88165	9.80977	0.07188	9.578	0.826
209	+0.70231	0.70953	+0.98982	0.416	+6.18	9.84653	9.85097	9.99555	9.619	0.791
210	+0.86162	0.50260	+1.71433	0.295	+7.58	9.93531	9.70122	0.23409	9.470	0.880
211	+0.70838	0.70344	+1.00703	0.413	+6.23	9.85027	9.84723	0.00304	9.616	0.795
212	+0.78177	0.62026	+1.26040	0.364	+6.88	9.89308	9.79257	0.10051	9.561	0.838
213	+0.78177	0.62026	+1.26039	0.364	+6.88	9.89308	9.79257	0.10051	9.561	0.838
214	+0.56136	0.82631	+0.67935	0.485	+4.94	9.74924	9.91714	9.83209	9.686	0.694
215	+0.70846	0.70335	+1.00726	0.413	+6.23	9.85031	9.84717	0.00314	9.616	0.795
216	+0.82387	0.56273	+1.46406	0.330	+7.25	9.91586	9.75030	0.16556	9.519	0.860
217	+0.61385	0.78782	+0.77917	0.462	+5.40	9.78806	9.89043	9.89163	9.665	0.733
218	+0.74921	0.65948	+1.13607	0.387	+6.59	9.87460	9.81920	0.05540	9.588	0.819
219	+0.74940	0.65926	+1.13673	0.387	+6.59	9.87471	9.81906	0.05566	9.587	0.819
220	+0.63811	0.76816	+0.83070	0.451	+5.62	9.80489	9.88545	9.91944	9.654	0.749
221	+0.84456	0.53097	+1.59061	0.312	+7.43	9.92663	9.72507	0.20156	9.493	0.871
222	-0.52617	0.84929	-0.61954	0.498	-4.63	9.72112 ⁿ	9.92906	9.79207 ⁿ	9.697	0.666 ⁿ
223	+0.63893	0.70749	+0.83249	0.450	+5.62	9.80545	9.88507	9.92038	9.653	0.750
224	+0.63872	0.76765	+0.83204	0.450	+5.62	9.80531	9.88516	9.92015	9.654	0.750
225	+0.67804	0.73351	+0.92437	0.430	+5.97	9.83126	9.86541	9.96585	9.634	0.776
226	-0.49752	0.86649	-0.57418	0.508	-4.38	9.69681 ⁿ	9.93776	9.75904 ⁿ	9.706	0.641 ⁿ
227	+0.78860	0.61149	+1.28964	0.359	+6.94	9.89686	9.78639	0.11047	9.555	0.841
228	+0.78845	0.61169	+1.28897	0.359	+6.94	9.89678	9.78653	0.11024	9.555	0.841
229	+0.78845	0.61170	+1.28895	0.359	+6.94	9.89677	9.78654	0.11024	9.555	0.841
230	+0.66160	0.74789	+0.88462	0.439	+5.82	9.82059	9.87384	9.94675	9.642	0.765
231	+0.76341	0.64291	+1.18743	0.377	+6.72	9.88276	9.80815	0.07461	9.577	0.827
232	+0.76341	0.64291	+1.18743	0.377	+6.72	9.88276	9.80815	0.07461	9.577	0.827
233	+0.76329	0.64306	+1.18696	0.377	+6.72	9.88269	9.80825	0.07444	9.577	0.827
234	+0.64400	0.76320	+0.84382	0.448	+5.67	9.80889	9.88264	9.92625	9.651	0.753
235	+0.64401	0.76320	+0.84383	0.448	+5.67	9.80889	9.88264	9.92626	9.651	0.753
236	+0.66354	0.74616	+0.88927	0.438	+5.84	9.82187	9.87283	9.94903	9.641	0.766
237	+0.66344	0.74627	+0.88902	0.438	+5.84	9.82180	9.87290	9.94891	9.641	0.766
238	+0.86039	0.50472	+1.70469	0.296	+7.57	9.93470	9.70305	0.23165	9.471	0.879
239	+0.72537	0.68579	+1.05772	0.402	+6.38	9.86056	9.83619	0.02437	9.605	0.805
240	+0.83455	0.54663	+1.52672	0.321	+7.34	9.92145	9.73769	0.18376	9.506	0.866

OBSERVATORIES, 1935LIST A—ACTIVE OBSERVATORIES

No.	Place	Longitude	Latitude	Altitude	Description
241	Rio de Janeiro, Brazil ...	+ ^h 2 ^m 52 53 ^a .46c	-22° 53' 42".2	^m 35	National Observatory
242	Rochester,* New York ...	+ 5 10 28.13	+43 10 10.5	178	Observatory of Bausch and Lomb Optical Co.
243	Rome,* Italy ...	- 0 49 56.34c	+41 53 33.2	65	Royal Observatory, at Capitol
244	Rome,* Italy ...	- 0 49 48.21a	+41 54 12.6	100	Vatican Observatory
245	Rugby, England ...	+ 0 05 02	+52 22 30	119	Temple Observatory
246	San Fernando, Spain ...	+ 0 24 49.30	+36 27 42.0	30	Naval Observatory
247	San Salvador, Salvador ...	+ 5 56 48	+13 42 00	682	National Observatory
248	Santa Clara, California ...	+ 8 07 48	+37 20.45	30	Obs. of Univ. of Santa Clara
249	Santiago,* Chile ...	+ 4 42 45.09c	-33 33 44.2	580	National Obs., at San Bernardo
250	Santiago, Chile ...	+ 4 42 36	-33 25 30	840	Obs. of Catholic Univ. of Chile†
251	Selsey (Sussex), England ...	+ 0 03 12.4	+50 43 49	10	Observatory of A. E. Levin
252	Sétif, Algeria ...	- 0 21 38.6	+36 11 10	1120	Observatory of Jarry Desloges
253	Sidmouth, England ...	+ 0 12 52.5	+50 41 13.3	171	Norman Lockyer Observatory
254	Simeis (Crimea), Russia ...	- 2 15 59.38	+44 24 11.6	360	Branch of Pulkovo Observatory
255	Singapore, Straits Settlements	- 6 55 17.40	+ 1 16 08.8	74	Mount Faber Observatory
256	Solihull, England ...	+ 0 07 09.86	+52 25 17.7	130	Observatory of B.M. Peek
257	Sonneberg, Germany ...	- 0 44 46.19	+50 22 41.4	640	Sonneberg Observatory
258	South Hadley, Mass. ...	+ 4 50 18.99	+42 15 18.2	76	Williston Obs., Mt. Holyoke Coll.
259	South Kensington (London), England	+ 0 00 42.4	+51 29 50	11	Imperial College Observatory
260	Springfield, Illinois ...	+ 5 58 34.2	+39 48 58.6	183	Obs. of Illinois Watch Co.
261	Springfield, Vermont ...	+ 4 45 56	+43 18	168	Observatory of J. Hartness
262	St. Albans, England ...	+ 0 01 20	+51 45	100	Observatory of W. A. Parr
263	St. Albans, England ...	+ 0 01 51.7	+51 49 02.0	134	Observatory of H. Webber
264	Stará Ľáda,‡ Czechoslovakia	- 1 12 45.5	+47 52 27.3	113	Astrophysical Observatory§
265	Stockholm,* Sweden ...	- 1 13 14.0	+59 16 18	55	Stockholm Obs., at Saltsjöbaden
266	Stonyhurst, England ...	+ 0 09 52.70a	+53 50 40.7	117	Stonyhurst College Observatory
267	Strasbourg, France ...	- 0 31 04.25a	+48 35 02.0	156	Strasbourg Observatory
268	Sutton (Surrey), England ...	+ 0 00 44.53	+51 22 19.8	51	Observatory of W. Doberck
269	Swarthmore, Pennsylvania	+ 5 01 25.62	+39 54 16.2	—	Sproul Obs., Swarthmore College
270	Sydney, New South Wales	-10 04 49.19	-33 51 41.1	44	Government Observatory
271	Sydney, New South Wales	-10 04 38.0 a	-33 49 49	42	Riverview Coll. Observatory
272	Syracuse, New York ...	+ 5 04 33.36	+43 02 13.1	160	Holden Obs., Syracuse Univ.
273	Syracuse, New York ...	+ 5 04 34.31	+43 00 48.8	137	Roe Observatory
274	Table Mountain, California	+ 7 50 44	+34 23	2286	Solar Radiation Station||
275	Tacubaya, D.F., Mexico ...	+ 6 36 46.74	+19 24 17.9	2311	National Observatory
276	Tananarive, Madagascar ...	- 3 10 12.45	-18 55 02.1	1381	Tananarive Observatory
277	Tartu (Dorpat), Estonia ...	- 1 46 53.18	+58 22 47.2	67	University Observatory
278	Tashkent (Turkestan), Russia	- 4 37 10.57a	+41 19 36.7	479	Tashkent Observatory
279	Teramo, Italy ...	- 0 54 55.8	+42 39 27	398	Cerulli Obs., at Collurania
280	Tokyo, Japan ...	- 9 18 10.10c	+35 40 21.4	59	Tokyo Astronomical Observatory, at Mitaka-mura

* See also List B. a Equatorial refractor. b Equatorial reflector. c Transit or meridian circle.

† On Cerro San Cristóbal; Southern Station of Lick Observatory, 1903-1929.

‡ Name changed from O-Gyalla, in 1918, when annexed from Hungary.

§ Formerly private observatory of von Konkoly.

|| Branch of Smithsonian Institution.

OBSERVATORIES, 1935

695

LIST A—ACTIVE OBSERVATORIES

No.	Natural Values of					Logarithms of				
	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{15} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{15} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$
241*	-0.38664	0.92169	-0.41949	0.541	-3.40	9.58730m	9.96459	9.62272m	9.733	0.532m
242	+0.68065	0.73050	+0.93176	0.429	+5.99	9.83292	9.86362	9.96930	9.632	0.777
243	+0.66425	0.74552	+0.89098	0.437	+5.85	9.82233	9.87246	9.94987	9.641	0.767
244	+0.66440	0.74540	+0.89133	0.437	+5.85	9.82243	9.87239	9.95004	9.641	0.767
245	+0.78838	0.61179	+1.28863	0.359	+6.94	9.89673	9.78660	0.11013	9.555	0.841
246	+0.59099	0.80521	+0.73396	0.472	+5.20	9.77158	9.90591	9.86567	9.674	0.716
247	+0.23532	0.97184	+0.24214	0.570	+2.07	9.37165	9.98759	9.38406	9.756	0.316
248	+0.60330	0.79598	+0.75793	0.467	+5.31	9.78053	9.90090	9.87963	9.669	0.725
249	-0.54974	0.83422	-0.65899	0.489	-4.84	9.74016m	9.92128	9.81888m	9.690	0.685m
250	-0.54777	0.83557	-0.65557	0.490	-4.82	9.73860m	9.92198	9.81662m	9.690	0.683m
251	+0.77052	0.63425	+1.21485	0.372	+6.79	9.88679	9.80226	0.08453	9.571	0.832
252	+0.58723	0.80819	+0.72660	0.474	+5.17	9.76881	9.90751	9.86130	9.676	0.713
253	+0.77007	0.63485	+1.21299	0.372	+6.78	9.88653	9.80267	0.08386	9.571	0.831
254	+0.69618	0.71565	+0.97279	0.420	+6.13	9.84272	9.85470	9.98802	9.623	0.787
255	+0.02200	0.99977	+0.02200	0.587	+0.19	8.34241	9.99990	8.34251	9.768	9.287
256	+0.78887	0.61115	+1.29080	0.359	+6.94	9.89701	9.78615	0.11086	9.555	0.841
257	+0.76670	0.63906	+1.19974	0.375	+6.75	9.88463	9.80554	0.07909	9.574	0.829
258	+0.66894	0.74130	+0.90239	0.435	+5.89	9.82539	9.86999	9.95539	9.638	0.770
259	+0.77892	0.62384	+1.24860	0.366	+6.85	9.89149	9.79507	0.09642	9.563	0.836
260	+0.63692	0.76918	+0.82805	0.451	+5.60	9.80408	9.88603	9.91805	9.654	0.749
261	+0.68231	0.72895	+0.93602	0.428	+6.00	9.83398	9.86270	9.97128	9.631	0.778
262	+0.78167	0.62039	+1.25997	0.364	+6.88	9.89302	9.79267	0.10036	9.561	0.838
263	+0.78240	0.61947	+1.26301	0.363	+6.89	9.89343	9.79202	0.10141	9.560	0.838
264	+0.73807	0.67202	+1.09829	0.394	+6.49	9.86810	9.82738	0.04072	9.596	0.813
265	+0.85596	0.51225	+1.67099	0.301	+7.53	9.93245	9.70948	0.22297	9.478	0.877
266	+0.80377	0.59128	+1.35936	0.347	+7.07	9.90513	9.77180	0.13334	9.540	0.850
267	+0.74631	0.66279	+1.12601	0.389	+6.57	9.87292	9.82138	0.05154	9.590	0.817
268	+0.77757	0.62555	+1.24302	0.367	+6.84	9.89074	9.79626	0.09448	9.565	0.835
269	+0.63808	0.76818	+0.83064	0.451	+5.62	9.80488	9.88546	9.91941	9.654	0.749
270	-0.55402	0.83126	-0.66648	0.488	-4.88	9.74353m	9.91974	9.82379m	9.688	0.688m
271	-0.55357	0.83156	-0.66570	0.488	-4.87	9.74317m	9.91990	9.82328m	9.688	0.688m
272	+0.67896	0.73208	+0.92745	0.429	+5.97	9.83185	9.86456	9.96729	9.633	0.776
273	+0.67866	0.73235	+0.92669	0.430	+5.97	9.83165	9.86472	9.96693	9.633	0.776
274	+0.56174	0.82646	+0.67969	0.485	+4.94	9.74953	9.91722	9.83231	9.686	0.694
275	+0.33025	0.94389	+0.34989	0.554	+2.91	9.51885	9.97492	9.54393	9.743	0.463
276	-0.32221	0.94653	-0.34041	0.555	-2.84	9.50813m	9.97613	9.53200m	9.745	0.453m
277	+0.84790	0.52557	+1.61327	0.308	+7.46	9.92834	9.72063	0.20771	9.489	0.873
278	+0.65693	0.75211	+0.87344	0.441	+5.78	9.81752	9.87628	9.94123	9.645	0.762
279	+0.67414	0.73660	+0.91521	0.432	+5.93	9.82875	9.86723	9.96152	9.636	0.773
280	+0.57990	0.81330	+0.71302	0.477	+5.10	9.76335	9.91025	9.85310	9.679	0.708

* The values given are for the position of the principal equatorial instrument.

OBSERVATORIES, 1935 LIST A—ACTIVE OBSERVATORIES

No.	Place	Longitude	Latitude	Altitude	Description
281	Toronto, Canada ...	+ 5 ^h 17 ^m 34 ^s .70	+43° 39' 46".0	110 ^m	University Observatory
282	Toronto, Canada ...	+ 5 17 34.67	+43 40 01.3	116	Meteorological Observatory
283	Tortosa, Spain ...	— 0 01 58	+40 49 14	54	Ebro Observatory
284	Toulouse, France ...	— 0 05 51.2 c	+43 36 44.0	195	University Observatory
285	Tow Law, England ...	+ 0 07 14.46b	+54 43 30	305	Wolsingham Obs. of T. E. Espin
286	Trieste, Italy ...	— 0 55 04.89	+45 38 35.5	67	Royal Astronomical Obs.
287	Trivandrum, India ...	— 5 07 59	+ 8 30 32	61	Obs. of Maharaja of Travancore
288	Tsingtao, China ...	— 8 01 16.81	+36 04 11	78	Astronomical Observatory
289	Tucson, Arizona ...	+ 7 23 47.68b	+32 13 59.4	757	Steward Obs., Univ. of Arizona
290	Turin, Italy ...	— 0 31 05.95	+45 02 16.3	618	Royal Obs., at Pino Torinese
291	Uccle (Brussels*), Belgium	— 0 17 25.99	+50 47 54.6	105	Royal Observatory
292	Ukiah, California ...	+ 8 12 50.3	+39 08 12.0	220	International Latitude Obs.
293	Uppsala,† Sweden ...	— 1 10 30.17a	+59 51 29.4	21	University Astronomical Obs.
294	Urbana, Illinois ...	+ 5 52 53.90a	+40 06 20.2	236	Obs. of University of Illinois
295	Utrecht, Holland ...	— 0 20 31.01a	+52 05 09.6	14	Zonnenburg Observatory
296	Valkenburg (Limburg), Holland	— 0 23 19.91	+50 52 29.3	100	Observatory of Ignatius College
297	Venice, Italy ...	— 0 49 18.2 b	+45 25 48.9	25	Obs. of Patriarchal Seminary
298	Victoria, British Columbia	+ 8 13 40.17	+48 31 15.7	229	Dominion Astrophysical Obs.
299	Vienna, Austria ...	— 1 05 21.38	+48 13 55.3	240	University Observatory
300	Vienna, Austria ...	— 1 05 29.76	+48 11 58.3	198	Obs. of Technical High School
301	Vienna, Austria ...	— 1 05 26.24	+48 12 40.5	211	Military Geographical Institute
302	Wanganui, New Zealand ...	—11 40 21 a	—39 57 10	23	Wanganui Observatory
303	Warsaw, Poland ...	— 1 24 10	+52 04 12	—	Observatory of Free Polish University, at Piaseczno
304	Warsaw, Poland ...	— 1 24 07.25	+52 13 04.6	121	University Observatory
305	Warsaw, Poland ...	— 1 24 02.4	+52 13 21.0	144	Obs. of the Polytechnic School
306	Washington, D.C. ...	+ 5 08 15.75c	+38 55 12.3	85	U.S. Naval Observatory
307	Washington, D.C. ...	+ 5 08 18.3 a	+38 54 26.0	62	Georgetown College Obs.
308	Washington, D.C. ...	+ 5 08 06.24	+38 53 17.3	10	Smithsonian Astrophysical Obs.
309	Wellesley, Massachusetts ...	+ 4 45 12.7	+42 17 34.8	61	Whitin Obs., Wellesley College
310	Wellington,* New Zealand	—11 39 04.03c	—41 17 03.8	127	Dominion Observatory†
311	West Norwood (London), England	+ 0 00 23.10	+51 26 09.9	38	Obs. of W. H. Steavenson
312	West Point, New York ...	+ 4 55 50.6	+41 23 22.1	146	U.S. Military Academy.
313	Wilhelmshaven, Germany	— 0 32 35.15	+53 31 52.1	9	Naval Observatory
314	Williams Bay, Wisconsin ...	+ 5 54 13.24a	+42 34 12.6	334	Yerkes Obs., Univ. of Chicago
315	Williamstown, Massachu- setts	+ 4 52 50	+42 42 30	213	Field Memorial Obs., Williams College
316	Wilno,* Poland ...	— 1 41 01.0 a	+54 41 00	133	University Observatory
317	Woltersdorf, Germany ...	— 0 46 50.94	+50 47 20.0	279	Obs. of Duke of Saxe-Altenburg
318	Worthing, England ...	+ 0 01 33.3	+50 48 50	11	Obs. of A. M. Newbegin§
319	Zô-Sê, China ...	— 8 04 44.75a	+31 05 47.6	100	Jesuit Obs., near Shanghai
320	Zurich, Switzerland ...	— 0 34 12.30a	+47 22 37.6	469	Observatory of Swiss Poly- technic School

* See also List B. a Equatorial refractor. b Equatorial reflector. c Transit or meridian circle.

† The modern spelling is Uppsala, but the above form is retained in astronomical usage.

‡ Formerly (1907–1925) Hector Observatory.

§ Transferred from Sutton* in 1927.

LIST A—ACTIVE OBSERVATORIES

No.	Natural Values of					Logarithms of				
	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{15} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$	$\rho \sin \phi'$	$\rho \cos \phi'$	$\tan \phi'$	$\frac{8.80}{15} \times \rho \cos \phi'$	$8.80 \times \rho \sin \phi'$
281	+0.68688	0.72459	+0.94796	0.425	+6.04	9.83688	9.86009	9.97679	9.628	0.781
282	+0.68694	0.72454	+0.94810	0.425	+6.05	9.83692	9.86006	9.97686	9.628	0.781
283	+0.65024	0.75786	+0.85800	0.445	+5.72	9.81307	9.87959	9.93349	9.648	0.758
284	+0.68626	0.72521	+0.94629	0.425	+6.04	9.83649	9.86046	9.97602	9.629	0.781
285	+0.81276	0.57883	+1.40416	0.340	+7.15	9.90996	9.76255	0.14741	9.531	0.854
286	+0.71142	0.70034	+1.01583	0.411	+6.26	9.85213	9.84531	0.00682	9.614	0.797
287	+0.14698	0.98908	+0.14860	0.580	+1.29	9.16726	9.99523	9.17203	9.764	0.112
288	+0.58550	0.80925	+0.72351	0.475	+5.15	9.76753	9.90809	9.85944	9.676	0.712
289	+0.53035	0.84680	+0.62630	0.497	+4.67	9.72456	9.92778	9.79678	9.696	0.669
290	+0.70407	0.70790	+0.99459	0.415	+6.20	9.84762	9.84997	9.99764	9.618	0.792
291	+0.77129	0.63334	+1.21781	0.372	+6.79	9.88722	9.80164	0.08558	9.570	0.832
292	+0.62779	0.77671	+0.80827	0.456	+5.52	9.79782	9.89026	9.90756	9.659	0.742
293	+0.86114	0.50341	+1.71061	0.295	+7.58	9.93507	9.70192	0.23315	9.470	0.880
294	+0.64079	0.76596	+0.83658	0.449	+5.64	9.80671	9.88420	9.92251	9.653	0.751
295	+0.78528	0.61577	+1.27528	0.361	+6.91	9.89502	9.78942	0.10560	9.558	0.840
296	+0.77213	0.63231	+1.22113	0.371	+6.79	9.88769	9.80093	0.08676	9.569	0.832
297	+0.70882	0.70298	+1.00831	0.412	+6.24	9.85054	9.84694	0.00359	9.615	0.795
298	+0.74560	0.66362	+1.12353	0.389	+6.56	9.87250	9.82192	0.05058	9.590	0.817
299	+0.74225	0.66739	+1.11217	0.392	+6.53	9.87055	9.82438	0.04617	9.593	0.815
300	+0.74187	0.66781	+1.11090	0.392	+6.53	9.87033	9.82465	0.04568	9.593	0.815
301	+0.74201	0.66766	+1.11136	0.392	+6.53	9.87041	9.82455	0.04585	9.593	0.815
302	-0.63873	0.76764	-0.83206	0.450	-5.62	9.80532 ^m	9.88516	9.92016 ^m	9.654	0.750 ^m
303	+0.78510	0.61599	+1.27454	0.361	+6.91	9.89493	9.78957	0.10535	9.558	0.839
304	+0.78670	0.61396	+1.28135	0.360	+6.92	9.89581	9.78814	0.10767	9.557	0.840
305	+0.78675	0.61390	+1.28156	0.360	+6.92	9.89584	9.78810	0.10774	9.556	0.840
306	+0.62485	0.77907	+0.80205	0.457	+5.50	9.79578	9.89158	9.90420	9.660	0.740
307	+0.62467	0.77921	+0.80168	0.457	+5.50	9.79565	9.89165	9.90400	9.660	0.740
308	+0.62441	0.77941	+0.80113	0.457	+5.49	9.79547	9.89176	9.90371	9.660	0.740
309	+0.66042	0.74085	+0.90359	0.435	+5.89	9.82570	9.86973	9.95597	9.638	0.770
310	-0.65634	0.75256	-0.87214	0.442	-5.78	9.81713 ^m	9.87654	9.94058 ^m	9.645	0.762 ^m
311	+0.77826	0.62468	+1.24587	0.366	+6.85	9.89113	9.79566	0.09547	9.564	0.836
312	+0.65771	0.75135	+0.87537	0.441	+5.79	9.81804	9.87585	9.94219	9.644	0.763
313	+0.80052	0.59568	+1.34386	0.349	+7.04	9.90337	9.77502	0.12836	9.543	0.848
314	+0.67302	0.73762	+0.91241	0.433	+5.92	9.82803	9.86783	9.96019	9.636	0.773
315	+0.67477	0.73598	+0.91684	0.432	+5.94	9.82916	9.86687	9.96229	9.635	0.774
316	+0.81232	0.57941	+1.40199	0.340	+7.15	9.90973	9.76298	0.14675	9.531	0.854
317	+0.77120	0.63349	+1.21740	0.372	+6.79	9.88717	9.80174	0.08543	9.570	0.832
318	+0.77145	0.63312	+1.21848	0.371	+6.79	9.88731	9.80149	0.08582	9.570	0.832
319	+0.51347	0.85708	+0.59910	0.503	+4.52	9.71052	9.93302	9.77750	9.701	0.655
320	+0.73227	0.67846	+1.07932	0.398	+6.44	9.86467	9.83152	0.03315	9.600	0.809

LIST B—FORMER OBSERVATORIES

Place	Longitude	Latitude	Altitude	Period of Activity	Description
Halifax, England ...	+ 0 07 28 ^m	+53 42 09 ^m	—	1872-1905	Obs. of the late Edward Crossley
Hamburg, Germany ...	— 0 39 53.6	+53 33 06	25	1821-1909	Former site of Hamburg Obs.†
Harrow, England ...	+ 0 01 19.9	+51 34 47	66	1882-1922	Obs. of the late Col. Tupman
Hartwell, England ...	+ 0 03 24.3	+51 48 36	—	1831-1866	Obs. of the late Dr. J. Lee
Hastings on Hudson, N.Y.	+ 4 55 29.7	+40 59 25	69	1860-1882	Obs. of the late Henry Draper
Heidelberg,* Germany ...	— 0 34 46.8	+49 24 34	126	1879-1898	Obs. of the late Dr. Max Wolf
Herény, Hungary ...	— 1 06 24.6	+47 15 47	229	1881-1909	Obs. of the late E. Gothard
Ipswich, England ...	— 0 04 55.8	+52 00 33	—	1874-1889	Obs. of the late Col. Tomline, at Orwell Park
Ithaca,* New York ...	+ 5 05 56.5	+42 26 51	—	1889-1902	Former Obs. of Cornell Univ.
Ithaca,* New York ...	+ 5 05 56.0	+42 26 47	256	1902-1915	Former site of Fwertes Obs. of Cornell University
Jena,* Germany ...	— 0 46 20.7	+50 56 16	174	1892-1910	Obs. of the late Dr. Winkler†
Jena,* Germany ...	— 0 46 20.3	+50 55 36	155	1812-1888	Former site of University Obs.
Karlsruhe, Germany ...	— 0 33 35.4	+49 00 30	110	1880-1896	Former site of Baden Obs.§
Kempshot, Jamaica ...	+ 5 11 29.5	+18 24 51	540	1872-1920	Obs. of the late Maxwell Hall
Kensington (London), Eng.	+ 0 00 46.8	+51 30 12	—	1826-1831	Obs. of the late Sir J. South
Kensington (London), Eng.	+ 0 00 49.4	+51 30 03	17	1886-1924	Obs. of the late W. H. Maw||
Kew (Surrey), England ...	+ 0 01 15	+51 28 06	6	1769-1840	Kew Observatory¶
Kyoto,* Japan ...	— 9 03 06.7	+35 01 37	55	1910-1929	Former site of Obs. of Kyoto Imperial University
Leiden,* Holland ...	— 0 17 56.6	+52 09 28	—	1632-1860	Former site of University Obs.
Leipzig,* Germany ...	— 0 49 29.9	+51 20 20	155	1791-1861	Former site of University Obs.
Leyton, England ...	+ 0 00 00.9	+51 34 34	—	1854-1886	Obs. of the late J. G. Barclay
Liverpool,* England ...	+ 0 12 00.1	+53 24 48	—	1843-1867	Former site of Liverpool Obs.
Liverpool, England ...	+ 0 11 38.7	+53 25 28	—	1840-1875	Obs. of the late W. Lassell
Lund, Sweden ...	— 0 52 47.5	+55 42 12	60	1658-1867	Former site of Royal Univ. Obs.
Lussinpiccolo,** Italy ...	— 0 57 52.3	+44 32 11	42	1893-1910	Manora Observatory
Mandeville,* Jamaica ...	+ 5 10 02	+18 01 00	640	1912-1926	Branch of Harvard College Obs.
Mannheim, Germany ...	— 0 33 50.4	+49 29 11	98	1775-1880	Former site of Heidelberg* Observatory††
Markree, Ireland ...	+ 0 33 48.4	+54 10 32	45	1824-1902	Obs. of the late E. J. and Col. Cooper
Marseille,* France ...	— 0 21 28.1	+43 17 52	29	1702-1864	Former site of National Obs., at Accoules
Mervel Hill (Surrey), Eng- land	+ 0 02 30.2	+51 08 12	128	1903-1910	Obs. of the late J. Franklin Adams
Mundenheim, Germany ...	— 0 33 44	+49 27 30	100	1907-1913	Observatory of Dr. M. Müндler
New Haven,* Connecticut	+ 4 51 42.2	+41 18 36	—	1830-1882	Former site of Yale Univ. Obs.
New York, New York ...	+ 4 55 56.7	+40 43 48	—	1850-1892	Obs. of the late L. M. Ruther- furd
New York, New York ...	+ 4 55 53.6	+40 45 23	—	1883-1897	Former site of Columbia Univ. Observatory
Oncativo, Argentina ...	+ 4 14 44.8	—31 55 10	280	1906-1908	International Latitude Obs.
Outwood (Surrey), England	+ 0 00 23.7	+51 11 38	119	1896-1924	Obs. of the late W. H. Maw
Paramatta (Sydney) N.S.W.	—10 04 00.2	—33 48 50	—	1827-1855	Obs. of the late Sir T. Brisbane
Pennant Hills, N.S.W. ...	—10 04 15.7	—33 44 31	188	—1932	Branch of Sydney Observatory
Plonsk, Poland ...	— 1 21 31.9	+52 37 40	—	1873-1898	Former site of Jędrzejewicz Observatory†††
Redhill (Surrey), England	+ 0 00 41.2	+51 14 25	—	1853-1870	Obs. of the late R. C. Carrington

* See also List A.

† Transferred to Bergedorf* in 1909.

‡ See also Gohlis.

§ Transferred from Mannheim in 1880; transferred to Heidelberg* in 1896. || See also Outwood.

¶ Now a Physical Observatory. ** Formerly in Austria. †† Transferred to Karlsruhe in 1880.

†† Transferred to Warsaw in 1898.

OBSERVATORIES, 1935

LIST B—FORMER OBSERVATORIES

Place	Longitude	Latitude	Altitude	Period of Activity	Description
Regents Park (London), Eng.	+ 0 00 37.1	+51° 31' 30"	—	1836-1861	Obs. of the late G. Bishop
Rochester, New York ...	+ 5 10 21.9	+43° 09' 17"	172	1882-1894	Warner Obs., built for Lewis Swift
Rochester,* New York ...	+ 5 10 29.6	+43° 10' 37"	150	1912-1920	Former site of Obs. of Bausch and Lomb Optical Co.
Rome,* Italy ...	- 0 49 48.3	+41° 54' 12"	100	-1907	Former site of Vatican Obs.†
Rome,* Italy ...	- 0 49 55.1	+41° 53' 54"	51	1776-1924	Royal Obs., at Roman College
Rousdon (Devon), England	+ 0 11 58.9	+50° 42' 38"	157	1884-1922	Obs. of the late Sir C. Peek
San Francisco, California ...	+ 8 09 42.9	+37° 47' 28"	382	1878-1911	Obs. of the late G. Davidson
San Luis, Argentina ...	+ 4 25 22	-33° 17' 46"	800	1909-1911	Southern Obs. of Carnegie Institution of Washington
Santiago,* Chile ...	+ 4 42 36.8	-33° 26' 25"	619	1852-1862	Former site of National Obs., at Santa Lucia
Santiago,* Chile ...	+ 4 42 46.3	-33° 26' 42"	519	1862-1910	Former site of National Obs., at Quinta Normal
Slough, England ...	+ 0 02 24	+51° 30' 20"	—	1783-1839	Obs. of the late Sir John Herschel
Sonneberg,* Germany ...	- 0 44 42.9	+50° 21' 30"	405	1920-1926	Former site of Sonneberg Obs.
South Kensington, England	+ 0 00 41.5	+51° 29' 48"	11	1875-1913	Solar Physics Observatory†
Southport, England ...	+ 0 11 56.5	+53° 39' 25"	12	1877-1887	Obs. of the late J. Baxendell
St. Helena ...	+ 0 22 54.6	-15° 55' 26"	213	1829-1833	Obs. of Hon. East India Co.§
Stjerneborg,|| Sweden ...	- 0 50 47.8	+55° 54' 21"	43	1584-1597	Observatory of Tycho Brahe
Stockholm,* Sweden ...	- 1 12 14.0	+59° 20' 33"	44	1753-1931	Former site of Stockholm Obs.
Sunderland, England ...	+ 0 05 31.1	+54° 53' 48"	49	1858-1920	Obs. of the late T. W. Backhouse
Sutton (Surrey), England	+ 0 00 44	+51° 21' 26"	70	1904-1927	Obs. of A. M. Newbegin¶
Taunton, Massachusetts ...	+ 4 44 20	+41° 54' 00"	8	1905-1910	Obs. of the late J. H. Metcalf**
Thames, New Zealand ...	-11 42 10.6	-37° 08' 23"	8	1884-1920	Obs. of the late J. Grigg
Tokyo,* Japan ...	- 9 18 58.7	+35° 39' 16"	25	1888-1924	Former site of Tokyo Obs., at Azabu
Tschardjui (Turkestan), Russia	- 4 13 57.3	+39° 08' 11"	167	1899-1909	Former site of International Latitude Observatory
Tschardjui (Turkestan), Russia	- 4 14 17.2	+39° 08' 11"	188	1909-1918	International Latitude Observatory
Tübingen, Germany ...	- 0 36 15.4	+48° 31' 22"	398	1911-1926	The Oesterberg Observatory
Tulse Hill (London), Eng.	+ 0 00 27.7	+51° 26' 47"	48	1866-1910	Obs. of the late Sir W. Huggins
Turin,* Italy ...	- 0 30 47.1	+45° 04' 08"	276	1791-1913	Former site of Royal Univ. Obs.
Uraniborg,|| Sweden ...	- 0 50 47.7	+55° 54' 25"	45	1576-1597	Observatory of Tycho Brahe
Utrecht,* Holland ...	- 0 20 28.9	+52° 05' 13"	23	1642-1854	Former site of Zonnenburg Obs.
Vienna, Austria ...	- 1 05 11.1	+48° 12' 47"	—	1884-1914	Obs. of von Kuffner
Vienna, Austria ...	- 1 05 25.3	+48° 12' 53"	—	1863-1886	Obs. of von Oppolzer
Vienna,* Austria ...	- 1 05 31.6	+48° 12' 35"	193	1753-1879	Former site of University Obs.
Warsaw, Poland ...	- 1 24 04.8	+52° 13' 10"	110	1898-1926	Jedzejewicz Observatory††
Washington,* D.C. ...	+ 5 08 12.1	+38° 53' 39"	31	1842-1893	Former site of U.S. Naval Obs.
Wellington,* New Zealand	-11 39 05.1	-41° 16' 47"	—	1869-1907	Colonial Time Service Obs.
Williamstown, Victoria ...	- 9 39 38.1	-37° 52' 07"	—	1853-1863	Former site of Govt. Obs.††
Wilno,* Poland ...	- 1 41 08.8	+54° 40' 59"	—	1753-1876	Former site of University Obs.
Winchester, Massachusetts	+ 4 44 32.4	+42° 27' 11"	30	1911-1920	Obs. of the late J. H. Metcalf§§
Windsor, N.S.W. ...	-10 03 19.9	-33° 36' 31"	16	1863-1916	Obs. of the late J. Tebbutt
Wrottesley, near Wolverhampton, England	+ 0 08 53.6	+52° 37' 23"	—	1842-1860	Observatory of the late Baron Wrottesley***
Zacatecas, Mexico ...	+ 6 50 12.2	+22° 46' 35"	2610	1904-1924	Obs. of District Government

* See also List A. † Founded by Pope Gregory XIII. ‡ Transferred to Cambridge* in 1913.
 § Observations made by Manuel J. Johnson. || Formerly in Denmark. ¶ Transferred to Worthing* in 1927. ** Transferred to Winchester in 1911. †† Formerly at Plonsk. ‡‡ Transferred to Melbourne* in 1863. §§ Formerly at Taunton. *** Transferred from Blackheath in 1842.

OBSERVATORIES, 1935

701

LIST C—INDEX LIST

Actual names of observatories are in bold type
Names of owners of private observatories are in italics

NAME, ETC.	PLACE	LIST	NAME, ETC.	PLACE	LIST
<i>Addey</i> ...	Grove Park	A	Columbia University	New York	B
Ann Arbor (Branch)	Bloemfontein	A	Commonwealth ...	Canberra	A
Ann Arbor (Branch)	Lake Angelus	A	<i>Cooper</i> ...	Markree	B
Arizona, Univ. of ...	Tucson	A	Cornell University ...	Ithaca	*
Azabu ...	Tokyo	B	Cracow (Branch) ...	Mt. Lysina	A
Babelsberg ...	Berlin	A	<i>Crawford, Earl of</i> ...	Dun Echt	B
<i>Backhouse</i> ...	Sunderland	B	Creighton University	Omaha	A
Baden ...	Heidelberg	A	<i>Crossley</i> ...	Halifax	B
Baldwin-Wallace Coll.	Berea	A	Dartmouth College	Hanover	A
<i>Barclay</i> ...	Leyton	B	<i>Davidson</i> ...	San Francisco	B
Bausch and Lomb ...	Rochester	*	<i>Daves</i> ...	Haddenham	B
<i>Baxendell</i> ...	Southport	B	Dearborn ...	Chicago	B
<i>Bennett</i> ...	Leiston	A	Dearborn ...	Evanston	A
Bidston ...	Liverpool	A	De Pauw University	Greencastle	A
<i>Bishop</i> ...	Regents Park	B	<i>Desloges</i> ...	Sétif	A
Bosscha ...	Lembang	A	Detroit ...	Ann Arbor	A
Bouzaréah ...	Algiers	A	<i>Doberck</i> ...	Sutton	A
Boyden Station of } Harvard Coll. Obs. }	Bloemfontein	A	Dominion ...	Ottawa	A
Brackett ...	Arequipa	B	Dominion ...	Wellington	A
<i>Brahé</i> ...	Claremont	A	Dominion	Victoria, B.C.	A
<i>Brahé</i> ...	Uraniborg	B	Astrophysical		
Brera ...	Stjerneborg	B	Dorpat ...	Tartu	A
Brera (Branch) ...	Milan	A	Drake University ...	Des Moines	A
<i>Brisbane</i> ...	Merate	A	<i>Draper</i> ...	Hastings on Hudson	B
Brown University ...	Paramatta†	B	Dudley ...	Albany	*
Brussels ...	Providence	A	Dunsink ...	Dublin	A
<i>Bülow von</i> ...	Uccle	A	<i>East India Co.</i> ...	St. Helena	B
Cajigal ...	Bothkamp	B	Ebro ...	Tortosa	A
California, Univ. of	Caracas	A	Echo Mountain ...	Mount Lowe	A
California, Univ. of	Berkeley	A	Engelhardt ...	Dresden	B
Calton Hill ...	Mt. Hamilton	A	Engelhardt ...	Kasan	A
Campos Rodrigues	Edinburgh	B	<i>Espin</i> ...	Tow Law	A
	Lourenço Marques	A	<i>Evershed</i> ...	Ewhurst	A
Capo di Monte ...	Naples	A	Fabra ...	Barcelona	A
Carleton College ...	Northfield	A	<i>Fauth</i> ...	Landstuhl	A
Carnegie Institution	Mount Wilson	A	Field Memorial ...	Williamstown	A
Carnegie Institution	San Luis	B	<i>Flammarion</i> ...	Juvisy	A
<i>Carrington</i> ...	Redhill	B	Floirac ...	Bordeaux	A
Cartuja ...	Granada	A	Florence ...	Arcetri	A
Case ...	Cleveland	A	Flower ...	Philadelphia	A
Central College ...	Fayette	A	<i>Franklin-Adams</i> ...	Mervel Hill	B
Cerulli ...	Teramo	A	<i>Frič</i> ...	Ondřejov	A
Chabot ...	Oakland	A	Fuertes ...	Ithaca	*
Chamberlin ...	Denver	A	Georgetown College	Washington	A
Charkow ...	Kharkov	A	<i>Gill</i> ...	Ascension	B
Charles University ...	Prague	A	Goodsell ...	Northfield	A
Charlottenburg ...	Berlin	A	<i>Gothard</i> ...	Herény	B
Chicago, Univ. of ...	Williams Bay	A	<i>Grigg</i> ...	Thames	B
Christiania ...	Oslo	A	<i>Groombridge</i> ...	Blackheath	B
Coats ...	Paisley	A	Haig ...	Dehra Dūn	A
Cointe ...	Liège	A	<i>Hall</i> ...	Kempshot	B
Colaba ...	Bombay	A	Halsted ...	Princeton	A
Collurania ...	Teramo	A			

* In both A and B Lists.

† Now spelt Parramatta.

OBSERVATORIES, 1935

LIST C—INDEX LIST

Actual names of observatories are in bold type
Names of owners of private observatories are in italics

NAME, ETC.	PLACE	LIST	NAME, ETC.	PLACE	LIST
Hamburg ...	Bergedorf ...	A	Lick ...	Mt. Hamilton	A
Hamilton College ...	Clinton ...	B	Lille, Univ. of ...	Hem ...	A
<i>Hargreaves</i> ...	Kingswood	A	Litchfield ...	Clinton ...	B
<i>Hartness</i> ...	Springfield ...	A	Lockyer, Norman	Sidmouth ...	A
Harvard ...	Cambridge ...	A	London, Univ. of ...	Mill Hill ...	A
Harvard (Branch)...	Arequipa ...	B	<i>Long</i> ...	Cape of Good Hope	A
Harvard (Branch)...	Bloemfontein	A	Lowell ...	Flagstaff ...	A
Harvard (Branch)...	Chuquicamata	B	Lwów ...	Lemberg ...	A
Harvard (Branch)...	Mandeville ...	B	<i>Maharaja of Travancore</i>	Trivandrum	A
Harvard (Branch)...	Oak Ridge ...	A	Maine, Univ. of ...	Orono ...	A
Haynald ...	Kalocsa ...	A	<i>Manora</i> ...	Lussinpiccolo	B
Hector ...	Wellington	A	Maria Mitchell ...	Nantucket ...	A
Hendaye ...	Abbadia ...	A	Mars Bay ...	Ascension ...	B
<i>Herschel</i> ...	Slough ...	B	<i>Maw</i> ...	Kensington	B
Holden ...	Syracuse ...	A	<i>Maw</i> ...	Outwood ...	B
Hood College ...	Frederick ...	A	Mazelspoort ...	Bloemfontein	A
<i>Huggins</i> ...	Tulse Hill ...	B	McCormick, Leander	Charlottesville	A
Ignatius College ...	Valkenburg	A	McGill University ...	Montreal ...	A
Illinois, Univ. of ...	Urbana ...	A	<i>McIntosh</i> ...	Auckland ...	A
Illinois Watch Co. ...	Springfield ...	A	McKim ...	Greencastle	A
Imperial College ...	South Kensington	A	McMath-Hulbert	Lake Angelus	A
Indiana, Univ. of ...	Bloomington	A	McMillin ...	Columbus ...	A
International Lat. ...	Bayswater ...	B	<i>Metcalf</i> ...	Taunton ...	B
International Lat. ...	Carloforte ...	A	<i>Metcalf</i> ...	Winchester	B
International Lat. ...	Gaithersburg	B	Michigan, Univ. of ...	Ann Arbor ...	A
International Lat. ...	Kitab ...	A	Michigan (Branch) ...	Bloemfontein	A
International Lat. ...	Mizusawa ...	A	Milan (Branch) ...	Merate ...	A
International Lat. ...	Oncativo ...	B	<i>Milicević</i> ...	Blaca ...	A
International Lat. ...	Tschardjui ...	B	Minnesota, Univ. of	Minneapolis	A
International Lat. ...	Ukiah ...	A	Mississippi, Univ. of	Oxford ...	A
<i>Jedrzejewicz</i> ...	Plonsk ...	B	Missouri, Univ. of ...	Columbia ...	A
<i>Jedrzejewicz</i> ...	Warsaw ...	B	Mitaka-mura ...	Tokyo ...	A
Jurjew ...	Tartu ...	A	Morrison ...	Fayette ...	A
Kansas, Univ. of ...	Lawrence ...	A	Mount Faber ...	Singapore ...	A
Kapteyn Laboratory	Groningen ...	A	Mount Holyoke Coll.	South Hadley	A
Kirkwood ...	Bloomington	A	Mount Stromlo ...	Canberra ...	A
<i>Knott</i> ...	Cuckfield ...	B	<i>Mündler</i> ...	Mundenheim	B
Königstuhl ...	Heidelberg	A	Natal ...	Durban ...	*
<i>Konkoly, von</i> ...	Stará Dala ...	A	<i>Newbegin</i> ...	Worthing ...	A
<i>Kuffner, von</i> ...	Vienna ...	B	<i>Newbegin</i> ...	Sutton ...	B
Kutchino ...	Moscow ...	A	Nizamiah ...	Hyderabad	A
Kwasan ...	Kyoto ...	A	Northwestern Univ.	Evanston ...	A
Ladd ...	Providence	A	Oesterberg ...	Tübingen ...	B
Lamonia, Urania	Faenza ...	A	O-Gyalla ...	Stará Dala ...	A
Lamont-Hussey ...	Bloemfontein	A	Olbers ...	Bremen ...	B
<i>Lassell</i> ...	Liverpool ...	B	Ole Römer ...	Aarhus ...	A
Latvia, Univ. of ...	Riga ...	A	<i>Oppolzer, von</i> ...	Vienna ...	B
Lawrence ...	Amherst ...	B	Orwell Park ...	Ipswich ...	B
Lawrence College ...	Appleton ...	A	Otago Institute ...	Dunedin ...	A
Laws ...	Columbia ...	A	... is (Branch) ...	Mont Blanc	A
<i>Lee</i> ...	... ..	A	... ..	St. Albans ...	A
			... ..	Birr Castle ...	B
			... ..	Solihull ...	A

LIST C—INDEX LIST

Actual names of observatories are in bold type
Names of owners of private observatories are in italics

NAME, ETC.	PLACE	LIST	NAME, ETC.	PLACE	LIST
<i>Peck</i>	Rousdon ...	B	Sproul	Swarthmore	A
Pennsylvania, Univ. of	Philadelphia	A	<i>Steavenson</i>	West	A
Perkins	Delaware ...	A		Norwood	
<i>Phillips</i>	Headley ...	A	Steward	Tucson ...	A
Piaseczno	Warsaw ...	A	<i>Strebel</i>	Herrsching	A
<i>Pickering</i>	Mandeville	A	Svábhegy	Budapest ...	A
Pino Torinese	Turin ...	A	<i>Swift</i>	Rochester ...	B
Pittsburgh, Univ. of	Allegheny ...	*	Sydney (Branch) ...	Pennant Hills	B
Pomona College ...	Claremont ...	A			
Poznań	Posen ...	A	Tapada	Lisbon ...	A
Presnia	Moscow ...	A	<i>Tebbutt</i>	Windsor ...	B
Pulkovo (Branch) ...	Simeis ...	A	Temple	Rugby ...	A
Pulkovo (Branch) ...	Nikolaieff ...	A	<i>Tomkins</i>	Dedham ...	A
			<i>Tomline</i>	Ipswich ...	B
Radcliffe	Oxford ...	A	Toulouse (Branch) ...	Pic du Midi	A
Remeis	Bamberg ...	A	Transvaal	Johannesburg	A
Riverview College ...	Sydney ...	A	Travancore	Trivandrum	A
<i>Roberts</i>	Crowborough	B	Treptow	Berlin ...	A
<i>Roberts</i>	Lovedale ...	A	<i>Tupman</i>	Harrow ...	B
Roe	Syracuse ...	A	Underwood	Appleton ...	A
Römer, Ole	Aarhus ...	A	Union	Johannesburg	A
<i>Rosse, Earl of</i>	Birr Castle	B	Urania	Berlin ...	A
Royal Alfred	Mauritius ...	A	Urania	Copenhagen	A
Rutgers University	New ...	A	Urania Lamonía ...	Faenza ...	A
	Brunswick				
<i>Rutherford</i>	New York ...	B	Vanderbilt Univ. ...	Nashville ...	A
			Vassar College ...	Poughkeepsie	A
Saâd-Naïl	Ksara ...	A	Vatican	Rome ...	A
Saltsjöbaden	Stockholm ...	A	Virginia, Univ. of ...	Charlottes-	A
Samoa	Apia ...	A		ville	
San Bernardo	Santiago ...	A	Vleck, van	Middletown	A
San Calixto, Coll. of	La Paz ...	A	Warner	Rochester ...	B
<i>Saxe-Altenburg,</i> Duke of	Wolfersdorf	A	Warner and Swasey ...	Cleveland ...	A
<i>Saxton</i>	Frome ...	B	Washburn	Madison ...	A
<i>Saxton</i>	Morwenstow	A	<i>Webber</i>	St. Albans	A
Sayre	Bethlehem ...	A	Wesleyan University	Delaware ...	A
S. Bartolome	Bogota ...	A	Wesleyan University	Middletown	A
Schanck	New ...	A	Western Reserve	Hudson ...	A
	Brunswick		Academy		
<i>Seagrave</i>	Providence	A	Whitin	Wellesley ...	A
Seeborg	Gotha ...	B	Williams	Frederick ...	A
<i>Sellers</i>	Muswell Hill	A	Williams College ...	Williamstown	A
Shanghai	Zô-Sè ...	A	Williston	South Hadley	A
Shattuck	Hanover ...	A	<i>Wilson</i>	Daramona ...	B
Smith	Beloit ...	A	<i>Winkler</i>	Gohlis ...	B
Smith	Berea ...	A	<i>Winkler</i>	Jena ...	B
Smith	Geneva ...	A	Wisconsin, Univ. of	Madison ...	A
Smith College ...	Northampton	A	<i>Wolf</i>	Heidelberg	B
Smithsonian Inst. ...	Washington	A	Wolsingham	Tow Law ...	A
	(Montezuma	A	<i>Wrottesley</i>	Blackheath	B
Smithsonian Inst.	Mt. Brukkaros	A			
(Branches)	Table ...	A	<i>Yalden</i>	Leonía ...	A
	Mountain		Yale	New Haven	*
<i>Smyth</i>	Bedford ...	B	Yale (Branch) ...	Johannesburg	A
South	Kensington	B	Yerkes	Williams Bay	A
			Zonnenburg	Utrecht ...	*

* In both A and B Lists.

^h -13	Wrangell Island*, Siberia* east of long. 172° 30' E.
-12 19 12	Tonga or Friendly Islands.
-12	Siberia* from long. 157° 30' E. to long. 172° 30' E., Kamchatka Peninsula*, Fiji Islands, Gilbert and Ellice Islands.
-11 30	New Zealand†, Chatham Islands.
-11 12	Norfolk Island.
-11	Siberia* from long. 142° 30' E. to long. 157° 30' E., Caroline Islands east of long. 154° E., New Caledonia, New Hebrides, Santa Cruz, Nauru and Marshall Islands, Ocean Island, Solomon Islands.
-10	Siberia* from long. 127° 30' E. to long. 142° 30' E., Tasmania, Victoria, New South Wales (except Broken Hill Area), Queensland, Lord Howe Island, British New Guinea, Caroline Islands from long. 148° E. to long. 154° E., Marianas or Ladrone Islands, Admiralty Islands.
- 9 30	South Australia, Broken Hill Area (N.S.W.), Northern Territory (Australia).
- 9	Siberia* from long. 112° 30' E. to long. 127° 30' E., Manchuria east of long. 127° 30' E., Japan, Korea, Caroline Islands west of long. 148° E., Kuril Islands, Dutch New Guinea, Kai Islands, Aroe and Tanimbar Islands, Schouten and Jappen Islands, Sakhalin.
- 8 30	Moluccas Islands.
- 8	Siberia* from long. 97° 30' E. to long. 112° 30' E., China (all the coast except Hainan Island and Pakhoi) including Wuchau on the West River and Ichang on the Yangtze Kiang, Hong Kong, Macao, Ryojun Ko (Port Arthur), Formosa, Pescadores Islands, Labuan, Philippine Islands, British North Borneo, Timor, Western Australia, Celebes, Sumbawa, Flores, Sumba.
- 7 30	Sarawak‡, Java, Madoera, Bali, Lombok, Dutch Borneo.
- 7 20	Muntok.
- 7	Siberia* from long. 82° 30' E. to long. 97° 30' E., Hainan Island and Pakhoi (China), French Indo-China, Siam, Straits Settlements, Federated Malay States, Southern Sumatra, Banka, Billiton.

* The Soviet Union, by a decree dated 1930 June 16, advanced all the clocks in the Union by one hour. The above times correspond to these advanced times.

† -12^h from the second Sunday in October to the third Sunday in March.

‡ - 7^h 50^m from September 14^d 00^h to December 14^d 00^h.

— 6 30 ^{h m s}	Andaman Islands, Burma, Cocos Islands, Nicobar Islands, Northern Sumatra.
— 6	Siberia* from long. 67° 30' E. to long. 82° 30' E.
— 5 53 20.8	Calcutta.
— 5 30	India (except Calcutta), Portuguese India, Ceylon, Laccadive Islands.
— 5	Novaya Zemlya*, Siberia* west of long. 67° 30' E., north coast of Russia* east of long. 52° 30' E., Chagos Archipelago.
— 4 54	Maldivé Islands.
— 4	North coast of Russia* from long. 40° E. to 52° 30' E., Mauritius, Réunion, Seychelles, Amirante Islands.
— 3	Russia*, north coast of Russia and north coast of Black Sea* west of long. 40° E., 'Iraq, Eritrea, French and Italian Somaliland, Tanganyika Territory, Madagascar, Comoro Islands, Socotra.
— 2 59 54	Aden, British Somaliland.
...	Zanzibar Island (clocks are set to 18 ^h at sunset).
— 2 30	Uganda, Kenya Colony and Protectorate.
— 2	(East European)—Finland, Estonia, Latvia, Romania, Bulgaria, Turkey, Greece, Cyprus, Palestine, Syria, Egypt, Anglo-Egyptian Sudan, Portuguese East Africa (Mozambique), Nyasaland, Rhodesia, Union of South Africa, eastern part of Belgian Congo (including Katanga), Bechuanaland, South West Africa.
— 1	(Mid-European)—Norway, Sweden, Denmark, Lithuania, Germany, Poland, Czechoslovakia, Austria, Hungary, Switzerland, Yugoslavia, Albania, Italy, Sardinia, Sicily, Malta, Tunisia, Libya, Nigeria, Cameroons, French Equatorial Africa, western part of Belgian Congo (including Kasai and Equateur), Angola (Portuguese West Africa), Danzig, Lichtenstein.
— 0 19 32.1	Holland†.
0	(Greenwich)—The Faeroes, Great Britain and Northern Ireland‡, Irish Free State‡, Channel Islands‡, Belgium‡, France§, Luxembourg‡, Spain, Portugal||, Gibraltar, Balearic Islands, Corsica§, Algeria, Morocco, Ivory Coast, Gold Coast Colony¶, Togoland, Dahomey, Principe, São Thomé, Spanish Guinea, Fernando Po, Monaco§.

* The Soviet Union, by a decree dated 1930 June 16, advanced all the clocks in the Union by one hour. The above times correspond to these advanced times.

† —1^h 19^m 32^s.1 from April to October approximately (fixed annually by Royal Decree).

‡ —1^h from April 14^d 02^h to October 6^d 02^h.

§ —1^h from the last Saturday in March, or if that comes before Easter, the Saturday following Easter, to the first Saturday in October.

|| Summer time is kept in Portugal, the dates of beginning and ending being fixed annually.

¶ January 1 to August 31 only, —0^h 20^m for rest of year.

+ 0 23 ^{h m s}	St. Helena.
+ 0 44	Liberia.
+ 0 57	Ascension Island.
+ 1	Iceland, Madeira, Canary Islands, Mauritania, Rio de Oro, Senegal, Portuguese and French Guinea, Sierra Leone, Gambia.
+ 2	Azores, Cape Verde Islands, Fernando Noronha, Trinidad Islands (South Atlantic).
+ 2 07	South Georgia.
+ 3	Eastern Brazil (including all the coast).
+ 3 30	Uruguay.
+ 3 31	Labrador and Newfoundland*.
+ 3 40 35	Dutch Guiana.
+ 3 45	British Guiana.
+ 4	(Atlantic)—Parts of Canada (Quebec† and Northwest Territories east of 68th meridian), New Brunswick†, Nova Scotia†, Prince Edward Island, St. Pierre and Miquelon, Puerto Rico, Leeward Islands, Bermuda, Guadeloupe, Martinique, St. Vincent, Barbados, Grenada, Tobago, St. Lucia, Trinidad, French Guiana, Central Brazil, Argentina‡, Falkland Islands§, Paraguay, Dominica Island, Windward Islands.
+ 4 30	Venezuela.
+ 4 33	Bolivia.
+ 4 36	Curaçao Island.
+ 4 40	Dominican Republic.
+ 5	(Eastern)—Parts of Canada (Quebec† and Ontario† from 68th to 90th meridian, Northwest Territories from 68th to 85th meridian), eastern states of U.S.A. (Connecticut, Delaware, Florida, Georgia||, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, West Virginia), Washington, D.C., Bahamas, Cuba, Haiti, Colombia, Jamaica, Panama Canal Zone, Chile¶, Peru, Western Brazil, Turks and Caicos Islands.

* +2^h 31^m from 22^h on the first Sunday in May to 23^h on the first Sunday in October.

† Summer time is used in certain localities, the dates of beginning and ending being fixed annually.

‡ Summer time is kept in Argentina, the dates of beginning and ending being fixed annually.

§ +3^h from the last week-end in September to the penultimate week-end in March.

|| This applies to the greater portion of the state.

¶ +4^h from September 1 to March 31.

+ 5 ^h 14 ^m 06 ^s .7	Ecuador (except Guayaquil).
+ 5 19 24	Guayaquil.
+ 5 25 36	Cayman Islands.
+ 5 45 10	Nicaragua.
+ 6	(Central)—Parts of Canada (Ontario* west of the 90th meridian, Manitoba, Northwest Territories from 85th to 102nd meridian, the south-easterly part of Saskatchewan*), central states of U.S.A. (Alabama, Arkansas, Illinois, Iowa, Indiana, Kansas†, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska†, North and South Dakota†, Ohio†, Oklahoma, Tennessee, Texas, Wisconsin), Mexico (except the Northern District of Lower California), Guatemala, British Honduras†, Honduras, Salvador, Costa Rica.
+ 7	(Mountain)—Parts of Canada (Saskatchewan* except the south-easterly part, Alberta, Northwest Territories from 102nd to 120th meridian), mountain states of U.S.A. (Arizona, Colorado, Idaho†, Montana†, New Mexico, Utah†, Wyoming).
+ 8	(Pacific)—Parts of Canada (British Columbia, Northwest Territories west of 120th meridian), Ketchikan, California, Nevada, Oregon, Washington, Northern District of Lower California (Mexico).
+ 9	Yukon, Parts of Alaska (Wrangell, Petersburg, Juneau, Sitka, Cordova).
+ 10	Parts of Alaska (Valdez, Seward, Anchorage, Fairbanks), Marquesas Islands, Tuamotu or Low Archipelago, Society and Austral Islands.
+ 10 30	Hawaiian (formerly Sandwich) Islands.
+ 10 38	Cook Islands (except Niue or Savage Island).
+ 11	Aleutian Islands, West Coast of Alaska (Nome), Samoa.
+ 11 20	Niue or Savage Island.

* Summer time is used in certain localities, the dates of beginning and ending being fixed annually.

† This applies to the greater portion of the state.

‡ +5^h 30^m from October 1 to February 14 (approximately).

				h	m	s
Aden ... ..	...	...	...	- 2	59	54
Admiralty Islands ...	...	...	...	- 10		
Alabama, U.S.A. ...	...	...	...	+ 6		
Alaska* ... ..	...	...	...	+ 8 to + 11 ^h		
Alaska, West Coast ...	...	...	...	+ 11		
Albania ... ..	...	...	...	- 1		
Alberta ... ..	...	...	...	+ 7		
Aleutian Islands ...	...	...	...	+ 11		
Algeria ... ..	...	...	...	0		
Amirante Islands ...	...	...	...	- 4		
Anchorage (Alaska) ...	...	...	...	+ 10		
Andaman Islands ...	...	...	...	- 6	30	
Angola (Portuguese West Africa) ...	...	...	...	- 1		
Argentina† ... ..	...	...	...	+ 4		
Arizona, U.S.A. ...	...	...	...	+ 7		
Arkansas, U.S.A. ...	...	...	...	+ 6		
Aroe Islands ... ..	...	...	...	- 9		
Ascension Island ...	...	...	...	+ 0	57	
Austral Islands ...	...	...	...	+ 10		
Austria ... ..	...	...	...	- 1		
Azores ... ..	...	...	...	+ 2		
Bahamas ... ..	...	...	...	+ 5		
Balearic Islands ...	...	...	...	0		
Bali ... ..	...	...	...	- 7	30	
Banka ... ..	...	...	...	- 7		
Barbados ... ..	...	...	...	+ 4		
Bechuanaland ... ..	...	...	...	- 2		
Belgian Congo (western part, including Kasai and Equateur) ...	...	...	...	- 1		
(eastern part, including Katanga) ...	...	...	...	- 2		
Belgium‡ ... ..	...	...	...	0		
Bermuda ... ..	...	...	...	+ 4		
Billiton ... ..	...	...	...	- 7		
Black Sea, north coast of (west of long. 40° E.) ...	...	...	...	- 3		
Bolivia ... ..	...	...	...	+ 4	33	
Brazil (Central) ...	...	...	...	+ 4		
Brazil (Eastern)§ ...	...	...	...	+ 3		
Brazil (Western) ...	...	...	...	+ 5		
British Columbia ...	...	...	...	+ 8		
British Guiana ...	...	...	...	+ 3	45	
British New Guinea ...	...	...	...	- 10		
British North Borneo ...	...	...	...	- 8		
British Somaliland ...	...	...	...	- 2	59	54
Broken Hill Area (N.S.W.) ...	...	...	...	- 9	30	
Bulgaria ... ..	...	...	...	- 2		
Burma ... ..	...	...	...	- 6	30	
Caicos Islands ...	...	...	...	+ 5		
Calcutta ... ..	...	...	...	- 5	53	20.8
California, U.S.A. ...	...	...	...	+ 8		
Cameroons ... ..	...	...	...	- 1		
Canada (see pp. 706-7) ...	...	...	...	+ 4 to + 9		
Canary Islands ...	...	...	...	+ 1		
Cape Verde Islands ...	...	...	...	+ 2		
Caroline Islands (east of long. 154° E.) ...	...	...	...	- 11		
(from long. 148° E. to long. 154° E.) ...	...	...	...	- 10		
(west of long. 148° E.) ...	...	...	...	- 9		
Cayman Islands ...	...	...	...	+ 5	25	36
Celebes ... ..	...	...	...	- 8		
Ceylon ... ..	...	...	...	- 5	30	
Chagos Archipelago ...	...	...	...	- 5		
Channel Islands‡ ...	...	...	...	0		
Chatham Islands ...	...	...	...	- 11	30	
Chile|| ... ..	...	...	...	+ 5		
China¶ ... ..	...	...	...	- 8		
Cocos Islands ...	...	...	...	- 6	30	
Colombia ... ..	...	...	...	+ 5		
Colorado, U.S.A. ...	...	...	...	+ 7		
Comoro Islands ...	...	...	...	- 3		
Connecticut, U.S.A. ...	...	...	...	+ 5		
Cook Islands (except Niue or Savage Island) ...	...	...	...	+ 10	38	
Cordova (Alaska) ...	...	...	...	+ 9		
Corsica** ... ..	...	...	...	0		

* See page 707.

† Summer time is kept in Argentina, the dates of beginning and ending being fixed annually.

‡ -1^h from April 14^d 02^h to October 6^d 02^h.

§ Including all the coast.

|| +4^h from September 1 to March 31.

¶ All the coast (except Hainan Island and Pakhoi), including Wuchau on the West River and Ichang on the Yangtze Kiang.

** -1^h from the last Saturday in March, or if that comes before Easter, the Saturday following Easter, to the first Saturday in October.

				^h	^m	^s					^h	^m	^s
Costa Rica ...	...	...	...	+	6						...	-	1
Cuba ...	...	...	...	+	5						...	0	
Curaçao Island ...	...	...	...	+	4	36					...	-12	
Cyprus ...	...	...	...	-	2						...	0	
Czechoslovakia ...	...	...	...	-	1						...	0	
Dahomey ...	...	...	...	0							...	- 2	
Danzig ...	...	...	...	-	1						...	+	4
Delaware, U.S.A. ...	...	...	...	+	5						...	+	4
Denmark ...	...	...	...	-	1						...	+	6
Dominica Island ...	...	...	...	+	4						...	+	5 19 24
Dominican Republic ...	...	...	...	+	4	40					...	+	3 45
Dutch Borneo ...	...	...	...	-	7	30					...	+	3 40 35
Dutch Guiana ...	...	...	...	+	3	40 35					...	+	4
Dutch New Guinea ...	...	...	...	-	9						...	+	1
Ecuador (except Guayaquil) ...	...	...	...	+	5	14 06·7					...	...	0
Egypt ...	...	...	...	-	2						...	...	0
Ellice Island ...	...	...	...	-12							...	...	0
Eritrea ...	...	...	...	- 3							...	...	0
Estonia ...	...	...	...	- 2							...	...	0
Faeroes, The ...	...	...	...	0							...	...	0
Fairbanks (Alaska) ...	...	...	...	+	10						...	...	0
Falkland Islands* ...	...	...	...	+	4						...	...	0
Federated Malay States ...	...	...	...	- 7							...	...	0
Fernando Noronha Island ...	...	...	...	+	2						...	...	0
Fernando Po ...	...	...	...	0							...	...	0
Fiji Islands ...	...	...	...	-12							...	...	0
Finland ...	...	...	...	- 2							...	...	0
Flores ...	...	...	...	- 8							...	...	0
Florida, U.S.A. ...	...	...	...	+	5						...	...	0
Formosa ...	...	...	...	- 8							...	...	0
France† ...	...	...	...	0							...	...	0
French Equatorial Africa ...	...	...	...	- 1							...	...	0
French Guiana ...	...	...	...	+	4						...	...	0
French Guinea ...	...	...	...	+	1						...	...	0
French Indo-China ...	...	...	...	- 7							...	...	0
French Somaliland ...	...	...	...	- 3							...	...	0
Friendly Islands ...	...	...	...	-12	19 12						...	...	0
Gambia ...	...	...	...	+	1						...	...	0
Georgia, ‡ U.S.A. ...	...	...	...	+	5						...	...	0
Germany ...	...	...	...	-	1						...	...	0
Gibraltar ...	...	...	...	0							...	...	0
Gilbert Island ...	...	...	...	-12							...	...	0
Gold Coast Colony§	...	...	...	0							...	...	0
Great Britain||	...	...	...	0							...	...	0
Greece ...	...	...	...	- 2							...	...	0
Grenada ...	...	...	...	+	4						...	...	0
Guadeloupe ...	...	...	...	+	4						...	...	0
Guatemala ...	...	...	...	+	6						...	...	0
Guayaquil ...	...	...	...	+	5	19 24					...	...	0
Guiana, British ...	...	...	...	+	3	45					...	...	0
Guiana, Dutch ...	...	...	...	+	3	40 35					...	...	0
Guiana, French ...	...	...	...	+	4						...	...	0
Guinea, French ...	...	...	...	+	1						...	...	0
Guinea, Spanish ...	...	...	...	0							...	...	0
Hainan Island (China) ...	...	...	...	- 7							...	...	0
Haiti ...	...	...	...	+	5						...	...	0
Hawaiian (formerly Sandwich) Islands ...	...	...	...	+	10	30					...	...	0
Holland¶	...	...	...	- 0	19 32·1						...	...	0
Honduras ...	...	...	...	+	6						...	...	0
Honduras, British**	...	...	...	+	6						...	...	0
Hong Kong ...	...	...	...	- 8							...	...	0
Hungary ...	...	...	...	- 1							...	...	0
Iceland ...	...	...	...	+	1						...	...	0
Idaho, † U.S.A. ...	...	...	...	+	7						...	...	0
Illinois, U.S.A. ...	...	...	...	+	6						...	...	0
India (except Calcutta) ...	...	...	...	- 5	30						...	...	0
Indiana, U.S.A. ...	...	...	...	+	6						...	...	0
Indo-China, French ...	...	...	...	- 7							...	...	0
Iowa, U.S.A. ...	...	...	...	+	6						...	...	0
'Iraq ...	...	...	...	- 3							...	...	0
Ireland, Northern||	...	...	...	0							...	...	0
Irish Free State||	...	...	...	0							...	...	0
Italian Somaliland ...	...	...	...	- 3							...	...	0
Italy ...	...	...	...	- 1							...	...	0
Ivory Coast ...	...	...	...	0							...	...	0

* +3^h from the last week-end in September to the penultimate week-end in March.

† -1^h from the last Saturday in March, or if that comes before Easter, the Saturday following Easter, to the first Saturday in October.

‡ This applies to the greater portion of the state.

§ January 1 to August 31 only, -0^h 20^m for rest of year.

|| -1^h from April 14^d 02^h to October 6^d 02^h.

¶ -1^h 19^m 32^s·1 from April to October approximately (fixed annually by Royal Decree).

** +5^h 30^m from October 1 to February 14 (approximately).

			h	m	s				h	m	s
Jamaica	+	5		Malta	...	...	...	- 1
Japan	-	9		Manchuria (east of long. 127°	...	...	...	...
Jappen Islands	-	9		30' E.)	...	...	...	- 9
Java	-	7 30		Manitoba	...	...	...	+ 6
Juneau (Alaska)	+	9		Marianas Islands	...	...	...	-10
							Marquesas Islands	...	...	...	+10
Kai Islands	-	9		Marshall Islands	...	...	...	-11
Kamchatka Peninsula*	-	12		Martinique	...	...	...	+ 4
Kansas,† U.S.A.	+	6		Maryland, U.S.A.	...	...	...	+ 5
Kentucky, U.S.A.	+	6		Massachusetts, U.S.A.	...	...	...	+ 5
Kenya	-	2 30		Mauritania	...	...	...	+ 1
Ketchikan (Alaska)	+	8		Mauritius	...	...	...	- 4
Korea	-	9		Mexico||	...	...	...	+ 6
Kuril Islands	-	9		Michigan, U.S.A.	...	...	...	+ 6
							Minnesota, U.S.A.	...	...	...	+ 6
Labrador‡	+	3 31		Miquelon	...	...	...	+ 4
Labuan	-	8		Mississippi, U.S.A.	...	...	...	+ 6
Laccadive Islands	-	5 30		Missouri, U.S.A.	...	...	...	+ 6
Ladrones Islands	-	10		Moluccas Islands	...	...	...	- 8 30
Latvia	-	2		Monaco¶	...	...	...	0
Leeward Islands	+	4		Montana,† U.S.A.	...	...	...	+ 7
Liberia	+	0 44		Morocco	...	...	...	0
Libya	-	1		Mozambique (Portuguese	...	...	...	...
Lichtenstein	-	1		East Africa)	...	...	...	- 2
Lithuania	-	1		Muntok	...	...	...	- 7 20
Lombok	-	7 30						
Lord Howe Island	-	10		Nauru Island	...	...	...	-11
Louisiana, U.S.A.	+	6		Nebraska,† U.S.A.	...	...	...	+ 6
Low Archipelago	+	10		Nevada, U.S.A.	...	...	...	+ 8
Lower California, Northern		New Brunswick**	...	...	...	+ 4
District of	+	8		New Caledonia	...	...	...	-11
Luxembourg§	0			New Hampshire, U.S.A.	...	...	...	+ 5
							New Hebrides	...	...	...	-11
Macao	-	8		New Jersey, U.S.A.	...	...	...	+ 5
Madagascar	-	3		New Mexico, U.S.A.	...	...	...	+ 7
Madeira	+	1		New South Wales††	...	...	...	-10
Madoera	-	7 30		New York, U.S.A.	...	...	...	+ 5
Maine, U.S.A.	+	5		New Zealand‡‡	...	...	...	-11 30
Maldiv Islands	-	4 54		Newfoundland‡	...	...	...	+ 3 31
							Nicaragua	...	...	...	+ 5 45 10
							Nicobar Islands	...	...	...	- 6 30

* The Soviet Union, by a decree dated 1930 June 16, advanced all the clocks in the Union by one hour. The above time corresponds to this advanced time.

† This applies to the greater portion of the state.

‡ +2^h 31^m from 22^h on the first Sunday in May to 23^h on the first Sunday in October.

§ -1^h from April 14^d 02^h to October 6^d 02^h.

|| Except the Northern District of Lower California.

¶ -1^h from the last Saturday in March, or if that comes before Easter, the Saturday following Easter, to the first Saturday in October.

** Summer time is used in certain localities, the dates of beginning and ending being fixed annually.

†† Except Broken Hill Area which uses the time -0^h 30^m.

‡‡ -12^h from the second Sunday in October to the third Sunday in March.

		h	m	s
Nigeria	-	1	
Niue Island	+	11	20
Nome (Alaska)	+	11	
Norfolk Island	-	11	12
North Carolina, U.S.A.	+	5	
North Dakota,* U.S.A.	+	6	
Northern Territory (Aust.)	-	9	30
Northwest Territories (east of 68th meridian)	+	4	
(from 68th to 85th meridian)	+	5	
(from 85th to 102nd meridian)	+	6	
(from 102nd to 120th meridian)	+	7	
(west of 120th meridian)	+	8	
Norway	-	1	
Nova Scotia†	+	4	
Novaya Zemlya‡	-	5	
Nyasaland	-	2	
Ocean Island	-	11	
Ohio,* U.S.A.	+	6	
Oklahoma, U.S.A.	+	6	
Ontario† (east of 90th meridian)	+	5	
(west of 90th meridian)	+	6	
Oregon, U.S.A.	+	8	
Pakhoi (China)	-	7	
Palestine	-	2	
Panama Canal Zone	+	5	
Paraguay	+	4	
Pennsylvania, U.S.A.	+	5	
Peru	+	5	
Pescadores Islands	-	8	
Petersburg (Alaska)	+	9	
Philippine Islands	-	8	
Poland	-	1	
Port Arthur (Ryojun Ko)	-	8	
Porto Rico—see Puerto Rico				
Portugal§		0	

		h	m	s
Portuguese East Africa (Mozambique) ...	...	-	2	
Portuguese Guinea ...	...	+	1	
Portuguese India ...	...	-	5	30
Portuguese West Africa (Angola) ...	...	-	1	
Prince Edward Island ...	...	+	4	
Principe ...	...	0		
Puerto Rico ...	...	+	4	
Quebec† (east of 68th meridian) ...	...	+	4	
(west of 68th meridian) ...	...	+	5	
Queensland ...	...	-	10	
Rarotonga ...	...	+	10	38
Réunion ...	...	-	4	
Rhode Island, U.S.A. ...	...	+	5	
Rhodesia ...	...	-	2	
Rio de Oro ...	...	+	1	
Romania ...	...	-	2	
Russia‡ (north coast west of long. 40° E.) ...	...	-	3	
(north coast from long. 40° E. to 52° 30' E.) ...	...	-	4	
(north coast east of long. 52° 30' E.) ...	...	-	5	
Ryojun Ko (Port Arthur) ...	...	-	8	
Sakhalin ...	...	-	9	
Salvador ...	...	+	6	
Samoa ...	...	+	11	
Sandwich Islands—see Hawaiian Islands				
Santa Cruz Islands ...	...	-	11	
São Thomé ...	...	0		
Sarawak|| ...	...	-	7	30
Sardinia ...	...	-	1	
Saskatchewan† (south-easterly part) ...	...	+	6	
(except south-easterly part) ...	...	+	7	

* This applies to the greater portion of the state.

† Summer time is used in certain localities, the dates of beginning and ending being fixed annually.

‡ The Soviet Union, by a decree dated 1930 June 16, advanced all the clocks in the Union by one hour. The above times correspond to these advanced times.

§ Summer time is kept in Portugal, the dates of beginning and ending being fixed annually.

|| -7^h 50^m from September 14^d 00^h to December 14^d 00^h.

		h	m	s
Savage Island ...	...	+11	20	
Schouten Islands ...	...	-	9	
Senegal ...	...	+	1	
Seward (Alaska) ...	...	+10		
Seychelles ...	...	-	4	
Siam ...	...	-	7	
Siberia* (west of long. 67° 30' E.) ...	...	-	5	
(from long. 67° 30' E. to long. 82° 30' E.) ...	...	-	6	
(from long. 82° 30' E. to long. 97° 30' E.) ...	...	-	7	
(from long. 97° 30' E. to long. 112° 30' E.) ...	...	-	8	
(from long. 112° 30' E. to long. 127° 30' E.) ...	...	-	9	
(from long. 127° 30' E. to long. 142° 30' E.) ...	...	-10		
(from long. 142° 30' E. to long. 157° 30' E.) ...	...	-11		
(from long. 157° 30' E. to long. 172° 30' E.) ...	...	-12		
(east of long. 172° 30' E.) ...	...	-13		
Sicily ...	...	-	1	
Sierra Leone ...	...	+	1	
Sitka (Alaska) ...	...	+	9	
Society Islands ...	...	+10		
Socotra ...	...	-	3	
Solomon Islands ...	...	-11		
Somaliland, British ...	...	-	2 59 54	
Somaliland, French ...	...	-	3	
Somaliland, Italian ...	...	-	3	
South Africa, Union of ...	...	-	2	
South Australia ...	...	-	9 30	
South Carolina, U.S.A. ...	...	+	5	
South Dakota,† U.S.A. ...	...	+	6	
South Georgia ...	...	+	2 07	
South West Africa ...	...	-	2	
Spain ...	...		0	
Spanish Guinea ...	...		0	
St. Helena ...	...	+	0 23	
St. Lucia ...	...	+	4	
St. Pierre ...	...	+	4	
Straits Settlements ...	...	-	7	
St. Vincent ...	...	+	4	
Sudan, Anglo-Egyptian ...	...	-	2	
Sumatra, Northern ...	...	-	6 30	
Sumatra, Southern ...	...	-	7	
Sumba ...	...	-	8	
Sumbawa ...	...	-	8	
Sweden ...	...	-	1	
Switzerland ...	...	-	1	
Syria ...	...	-	2	
Tanganyika Territory ...	...	-	3	
Tanimbar Islands ...	...	-	9	
Tasmania ...	...	-10		
Tennessee, U.S.A. ...	...	+	6	
Texas, U.S.A. ...	...	+	6	
Timor ...	...	-	8	
Tobago ...	...	+	4	
Togoland ...	...		0	
Tonga Islands ...	...	-12 19 12		
Trinidad ...	...	+	4	
Trinidad Islands (S. Atlantic) ...	...	+	2	
Tuamotu Archipelago ...	...	+10		
Tunisia ...	...	-	1	
Turkey ...	...	-	2	
Turks Islands ...	...	+	5	
Uganda ...	...	-	2 30	
Union of South Africa ...	...	-	2	
Uruguay ...	...	+	3 30	
Utah,† U.S.A. ...	...	+	7	
Valdez (Alaska) ...	...	+	10	
Venezuela ...	...	+	4 30	
Vermont, U.S.A. ...	...	+	5	
Victoria ...	...	-10		
Virginia, U.S.A. ...	...	+	5	
Washington, D.C., U.S.A. ...	...	+	5	
Washington, U.S.A. ...	...	+	8	
West Virginia, U.S.A. ...	...	+	5	
Western Australia ...	...	-	8	

* The Soviet Union, by a decree dated 1930 June 16, advanced all the clocks in the Union by one hour. The above times correspond to these advanced times.

† This applies to the greater portion of the state.

				^h	^m	^s					^h	^m	^s
Windward Islands ...	...	+	4				Yugoslavia ...	...	...	-	1		
Wisconsin, U.S.A. ...	...	+	6				Yukon ...	...	...	+	9		
Wrangell (Alaska) ...	...	+	9										
Wrangell Island* ...	...	-	13										
Wyoming, U.S.A. ...	...	+	7				Zanzibar Island†	...	...	-	

* The Soviet Union, by a decree dated 1930 June 16, advanced all the clocks in the Union by one hour. The above time corresponds to this advanced time.

† Clocks are set to 18^h at sunset.

DATE OR CALENDAR LINE

The Date or Calendar Line is a modification of the line of the 180th meridian, which is drawn so as to include islands of any one group, etc., on the same side of the line.

It may be traced by joining up the following positions :—

Lat. 60° 00' S.	Long. 180° 00'	Lat. 48° 00' N.	Long. 180° 00'
„ 51 30 S.	„ 180 00	„ 52 30 N.	„ 170 00 E.
„ 45 30 S.	„ 172 30 W.	„ 65 00 N.	„ 169 00 W.
„ 15 30 S.	„ 172 30 W.	„ 70 00 N.	„ 180 00
„ 5 00 S.	„ 180 00		

When crossing this line on a westerly course, the date must be advanced one day ; when crossing it on an easterly course, the date must be put back one day.

TABLE I

JULIAN DAY NUMBER

DAYS ELAPSED AT MEAN NOON OF JANUARY 0 OF EACH YEAR OF THE TABLE

Yr. A.D.	0	100	200	300	400	500	600	700	800	900
0	172 1057	175 7582	179 4107	183 0632	186 7157	190 3682	194 0207	197 6732	201 3257	204 9782
4	172 2518	175 9043	179 5568	183 2093	186 8618	190 5143	194 1668	197 8193	201 4718	205 1243
8	172 3979	176 0504	179 7029	183 3554	187 0079	190 6604	194 3129	197 9654	201 6179	205 2704
12	172 5440	176 1965	179 8490	183 5015	187 1540	190 8065	194 4590	198 1115	201 7640	205 4165
16	172 6901	176 3426	179 9951	183 6476	187 3001	190 9526	194 6051	198 2576	201 9101	205 5626
20	172 8362	176 4887	180 1412	183 7937	187 4462	191 0987	194 7512	198 4037	202 0562	205 7087
24	172 9823	176 6348	180 2873	183 9398	187 5923	191 2448	194 8973	198 5498	202 2023	205 8548
28	173 1284	176 7809	180 4334	184 0859	187 7384	191 3909	195 0434	198 6959	202 3484	206 0009
32	173 2745	176 9270	180 5795	184 2320	187 8845	191 5370	195 1895	198 8420	202 4945	206 1470
36	173 4206	177 0731	180 7256	184 3781	188 0306	191 6831	195 3356	198 9881	202 6406	206 2931
40	173 5667	177 2192	180 8717	184 5242	188 1767	191 8292	195 4817	199 1342	202 7867	206 4392
44	173 7128	177 3653	181 0178	184 6703	188 3228	191 9753	195 6278	199 2803	202 9328	206 5853
48	173 8589	177 5114	181 1639	184 8164	188 4689	192 1214	195 7739	199 4264	203 0789	206 7314
52	174 0050	177 6575	181 3100	184 9625	188 6150	192 2675	195 9200	199 5725	203 2250	206 8775
56	174 1511	177 8036	181 4561	185 1086	188 7611	192 4136	196 0661	199 7186	203 3711	207 0236
60	174 2972	177 9497	181 6022	185 2547	188 9072	192 5597	196 2122	199 8647	203 5172	207 1697
64	174 4433	178 0958	181 7483	185 4008	189 0533	192 7058	196 3583	200 0108	203 6633	207 3158
68	174 5894	178 2419	181 8944	185 5469	189 1994	192 8519	196 5044	200 1569	203 8094	207 4619
72	174 7355	178 3880	182 0405	185 6930	189 3455	192 9980	196 6505	200 3030	203 9555	207 6080
76	174 8816	178 5341	182 1866	185 8391	189 4916	193 1441	196 7966	200 4491	204 1016	207 7541
80	175 0277	178 6802	182 3327	185 9852	189 6377	193 2902	196 9427	200 5952	204 2477	207 9002
84	175 1738	178 8263	182 4788	186 1313	189 7838	193 4363	197 0888	200 7413	204 3938	208 0463
88	175 3199	178 9724	182 6249	186 2774	189 9299	193 5824	197 2349	200 8874	204 5399	208 1924
92	175 4660	179 1185	182 7710	186 4235	190 0760	193 7285	197 3810	201 0335	204 6860	208 3385
96	175 6121	179 2646	182 9171	186 5696	190 2221	193 8746	197 5271	201 1796	204 8321	208 4846

To obtain the Julian Day Number for any date before the beginning of the Christian Era, the date must first be expressed astronomically, i.e. diminished by 1. Then add the smallest multiple of 1000 years that will convert the date into an A.D. date, take out the Julian Day Number for the A.D. date thus obtained, and subtract 365250 days for each multiple of 1000 years added.

Example :—Required the Julian Day Number of May 5, 1234 B.C.

Astronomical date = - 1233 May 5

$2 \times 1000 = + 2000$

Sum = + 767 May 5

Julian Day Number on January 0 of A.D. 764 ... 200 0108

Days from January 0 to May 0, 3 years later ... 1216

Days from May 0 to May 5 ... 5

Sum = Julian Day Number A.D. 767, May 5 ... 200 1329

Two multiples of 365250 days ... 73 0500

Difference = Julian Day Number May 5, 1234 B.C. 127 0829

TABLE I

715

JULIAN DAY NUMBER

DAYS ELAPSED AT MEAN NOON OF JANUARY 0 OF EACH YEAR OF THE TABLE

Yr. A.D.	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
0	208 6307	212 2832	215 9357	219 5882	223 2407	226 8932	230 5447	234 1971*	237 8495*	241 5019*
4	208 7768	212 4293	216 0818	219 7343	223 3868	227 0393	230 6908	234 3432	237 9956	241 6480
8	208 9229	212 5754	216 2279	219 8804	223 5329	227 1854	230 8369	234 4893	238 1417	241 7941
12	209 0690	212 7215	216 3740	220 0265	223 6790	227 3315	230 9830	234 6354	238 2878	241 9402
16	209 2151	212 8676	216 5201	220 1726	223 8251	227 4776	231 1291	234 7815	238 4339	242 0863
20	209 3612	213 0137	216 6662	220 3187	223 9712	227 6237	231 2752	234 9276	238 5800	242 2324
24	209 5073	213 1598	216 8123	220 4648	224 1173	227 7698	231 4213	235 0737	238 7261	242 3785
28	209 6534	213 3059	216 9584	220 6109	224 2634	227 9159	231 5674	235 2198	238 8722	242 5246
32	209 7995	213 4520	217 1045	220 7570	224 4095	228 0620	231 7135	235 3659	239 0183	242 6707
36	209 9456	213 5981	217 2506	220 9031	224 5556	228 2081	231 8596	235 5120	239 1644	242 8168
40	210 0917	213 7442	217 3967	221 0492	224 7017	228 3542	232 0057	235 6581	239 3105	242 9629
44	210 2378	213 8903	217 5428	221 1953	224 8478	228 5003	232 1518	235 8042	239 4566	243 1090
48	210 3839	214 0364	217 6889	221 3414	224 9939	228 6464	232 2979	235 9503	239 6027	243 2551
52	210 5300	214 1825	217 8350	221 4875	225 1400	228 7925	232 4440	236 0964	239 7488	243 4012
56	210 6761	214 3286	217 9811	221 6336	225 2861	228 9386	232 5901	236 2425	239 8949	243 5473
60	210 8222	214 4747	218 1272	221 7797	225 4322	229 0847	232 7362	236 3886	240 0410	243 6934
64	210 9683	214 6208	218 2733	221 9258	225 5783	229 2308	232 8823	236 5347	240 1871	243 8395
68	211 1144	214 7669	218 4194	222 0719	225 7244	229 3769	233 0284	236 6808	240 3332	243 9856
72	211 2605	214 9130	218 5655	222 2180	225 8705	229 5230	233 1745	236 8269	240 4793	244 1317
76	211 4066	215 0591	218 7116	222 3641	226 0166	229 6691	233 3206	236 9730	240 6254	244 2778
80	211 5527	215 2052	218 8577	222 5102	226 1627	229 8152	233 4667	237 1191	240 7715	244 4239
84	211 6988	215 3513	219 0038	222 6563	226 3088	229 9603	233 6128	237 2652	240 9176	244 5700
88	211 8449	215 4974	219 1499	222 8024	226 4549	230 1064	233 7589	237 4113	241 0637	244 7161
92	211 9910	215 6435	219 2960	222 9485	226 6010	230 2525	233 9050	237 5574	241 2098	244 8622
96	212 1371	215 7896	219 4421	223 0946	226 7471	230 3986	234 0511	237 7035	241 3559	245 0083

NUMBER OF DAYS TO BE ADDED TO REDUCE TO THE BEGINNING OF EACH MONTH

Year	Jan. 0	Feb. 0	Mar. 0	Apr. 0	May 0	June 0	July 0	Aug. 0	Sept. 0	Oct. 0	Nov. 0	Dec. 0
0	0*	31*	60	91	121	152	182	213	244	274	305	335
1	366	397	425	456	486	517	547	578	609	639	670	700
2	731	762	790	821	851	882	912	943	974	1004	1035	1065
3	1096	1127	1155	1186	1216	1247	1277	1308	1339	1369	1400	1430

Note.—From 1582 Oct. 15 to 1583 Dec. 31 inclusive, the numbers given by the above tables must be diminished by 10.

* The numbers given for the years 1700, 1800 and 1900, which were not Leap Years, are for January - 1, consequently the numbers 0 and 31 for Jan. 0 and Feb. 0 of these years must be increased to 1 and 32. For all other months the two tables are used in the normal manner.

A more extended table for the years 1860-1950 is given in Table II. For the current year see pages 2-5.

TABLE II

JULIAN DAY NUMBER

DAYS ELAPSED AT MEAN NOON OF EACH DATE OF THE TABLE

Year	Jan. o	Feb. o	Mar. o	Apr. o	May o	June o	July o	Aug. o	Sept. o	Oct. o	Nov. o	Dec. o
1860	240 0410	0441	0470	0501	0531	0562	0592	0623	0654	0684	0715	0745
1861	240 0776	0807	0835	0866	0896	0927	0957	0988	1019	1049	1080	1110
1862	240 1141	1172	1200	1231	1261	1292	1322	1353	1384	1414	1445	1475
1863	240 1506	1537	1565	1596	1626	1657	1687	1718	1749	1779	1810	1840
1864	240 1871	1902	1931	1962	1992	2023	2053	2084	2115	2145	2176	2206
1865	240 2237	2268	2296	2327	2357	2388	2418	2449	2480	2510	2541	2571
1866	240 2602	2633	2661	2692	2722	2753	2783	2814	2845	2875	2906	2936
1867	240 2967	2998	3026	3057	3087	3118	3148	3179	3210	3240	3271	3301
1868	240 3332	3363	3392	3423	3453	3484	3514	3545	3576	3606	3637	3667
1869	240 3698	3729	3757	3788	3818	3849	3879	3910	3941	3971	4002	4032
1870	240 4063	4094	4122	4153	4183	4214	4244	4275	4306	4336	4367	4397
1871	240 4428	4459	4487	4518	4548	4579	4609	4640	4671	4701	4732	4762
1872	240 4793	4824	4853	4884	4914	4945	4975	5006	5037	5067	5098	5128
1873	240 5159	5190	5218	5249	5279	5310	5340	5371	5402	5432	5463	5493
1874	240 5524	5555	5583	5614	5644	5675	5705	5736	5767	5797	5828	5858
1875	240 5889	5920	5948	5979	6009	6040	6070	6101	6132	6162	6193	6223
1876	240 6254	6285	6314	6345	6375	6406	6436	6467	6498	6528	6559	6589
1877	240 6620	6651	6679	6710	6740	6771	6801	6832	6863	6893	6924	6954
1878	240 6985	7016	7044	7075	7105	7136	7166	7197	7228	7258	7289	7319
1879	240 7350	7381	7409	7440	7470	7501	7531	7562	7593	7623	7654	7684
1880	240 7715	7746	7775	7806	7836	7867	7897	7928	7959	7989	8020	8050
1881	240 8081	8112	8140	8171	8201	8232	8262	8293	8324	8354	8385	8415
1882	240 8446	8477	8505	8536	8566	8597	8627	8658	8689	8719	8750	8780
1883	240 8811	8842	8870	8901	8931	8962	8992	9023	9054	9084	9115	9145
1884	240 9176	9207	9236	9267	9297	9328	9358	9389	9420	9450	9481	9511
1885	240 9542	9573	9601	9632	9662	9693	9723	9754	9785	9815	9846	9876
1886	240 9907	9938	9966	9997	*0027	*0058	*0088	*0119	*0150	*0180	*0211	*0241
1887	241 0272	0303	0331	0362	0392	0423	0453	0484	0515	0545	0576	0606
1888	241 0637	0668	0697	0728	0758	0789	0819	0850	0881	0911	0942	0972
1889	241 1003	1034	1062	1093	1123	1154	1184	1215	1246	1276	1307	1337
1890	241 1368	1399	1427	1458	1488	1519	1549	1580	1611	1641	1672	1702
1891	241 1733	1764	1792	1823	1853	1884	1914	1945	1976	2006	2037	2067
1892	241 2098	2129	2158	2189	2219	2250	2280	2311	2342	2372	2403	2433
1893	241 2464	2495	2523	2554	2584	2615	2645	2676	2707	2737	2768	2798
1894	241 2829	2860	2888	2919	2949	2980	3010	3041	3072	3102	3133	3163
1895	241 3194	3225	3253	3284	3314	3345	3375	3406	3437	3467	3498	3528
1896	241 3559	3590	3619	3650	3680	3711	3741	3772	3803	3833	3864	3894
1897	241 3925	3956	3984	4015	4045	4076	4106	4137	4168	4198	4229	4259
1898	241 4290	4321	4349	4380	4410	4441	4471	4502	4533	4563	4594	4624
1899	241 4655	4686	4714	4745	4775	4806	4836	4867	4898	4928	4959	4989
1900	241 5020	5051	5079	5110	5140	5171	5201	5232	5263	5293	5324	5354
1901	241 5385	5416	5444	5475	5505	5536	5566	5597	5628	5658	5689	5719
1902	241 5750	5781	5809	5840	5870	5901	5931	5962	5993	6023	6054	6084
1903	241 6115	6146	6174	6205	6235	6266	6296	6327	6358	6388	6419	6449
1904	241 6480	6511	6540	6571	6601	6632	6662	6693	6724	6754	6785	6815

For dates before 1860 see Table I.

TABLE II

717

JULIAN DAY NUMBER

DAYS ELAPSED AT MEAN NOON OF EACH DATE OF THE TABLE

Year	Jan. o	Feb. o	Mar. o	Apr. o	May o	June o	July o	Aug. o	Sept. o	Oct. o	Nov. o	Dec. o
1905	241 6846	6877	6905	6936	6966	6997	7027	7058	7089	7119	7150	7180
1906	241 7211	7242	7270	7301	7331	7362	7392	7423	7454	7484	7515	7545
1907	241 7576	7607	7635	7666	7696	7727	7757	7788	7819	7849	7880	7910
1908	241 7941	7972	8001	8032	8062	8093	8123	8154	8185	8215	8246	8276
1909	241 8307	8338	8366	8397	8427	8458	8488	8519	8550	8580	8611	8641
1910	241 8672	8703	8731	8762	8792	8823	8853	8884	8915	8945	8976	9006
1911	241 9037	9068	9096	9127	9157	9188	9218	9249	9280	9310	9341	9371
1912	241 9402	9433	9462	9493	9523	9554	9584	9615	9646	9676	9707	9737
1913	241 9768	9799	9827	9858	9888	9919	9949	9980	*0011	*0041	*0072	*0102
1914	242 0133	0164	0192	0223	0253	0284	0314	0345	0376	0406	0437	0467
1915	242 0498	0529	0557	0588	0618	0649	0679	0710	0741	0771	0802	0832
1916	242 0863	0894	0923	0954	0984	1015	1045	1076	1107	1137	1168	1198
1917	242 1229	1260	1288	1319	1349	1380	1410	1441	1472	1502	1533	1563
1918	242 1594	1625	1653	1684	1714	1745	1775	1806	1837	1867	1898	1928
1919	242 1959	1990	2018	2049	2079	2110	2140	2171	2202	2232	2263	2293
1920	242 2324	2355	2384	2415	2445	2476	2506	2537	2568	2598	2629	2659
1921	242 2690	2721	2749	2780	2810	2841	2871	2902	2933	2963	2994	3024
1922	242 3055	3086	3114	3145	3175	3206	3236	3267	3298	3328	3359	3389
1923	242 3420	3451	3479	3510	3540	3571	3601	3632	3663	3693	3724	3754
1924	242 3785	3816	3845	3876	3906	3937	3967	3998	4029	4059	4090	4120
1925	242 4151	4182	4210	4241	4271	4302	4332	4363	4394	4424	4455	4485
1926	242 4516	4547	4575	4606	4636	4667	4697	4728	4759	4789	4820	4850
1927	242 4881	4912	4940	4971	5001	5032	5062	5093	5124	5154	5185	5215
1928	242 5246	5277	5306	5337	5367	5398	5428	5459	5490	5520	5551	5581
1929	242 5612	5643	5671	5702	5732	5763	5793	5824	5855	5885	5916	5946
1930	242 5977	6008	6036	6067	6097	6128	6158	6189	6220	6250	6281	6311
1931	242 6342	6373	6401	6432	6462	6493	6523	6554	6585	6615	6646	6676
1932	242 6707	6738	6767	6798	6828	6859	6889	6920	6951	6981	7012	7042
1933	242 7073	7104	7132	7163	7193	7224	7254	7285	7316	7346	7377	7407
1934	242 7438	7469	7497	7528	7558	7589	7619	7650	7681	7711	7742	7772
1935	242 7803	7834	7862	7893	7923	7954	7984	8015	8046	8076	8107	8137
1936	242 8168	8199	8228	8259	8289	8320	8350	8381	8412	8442	8473	8503
1937	242 8534	8565	8593	8624	8654	8685	8715	8746	8777	8807	8838	8868
1938	242 8899	8930	8958	8989	9019	9050	9080	9111	9142	9172	9203	9233
1939	242 9264	9295	9323	9354	9384	9415	9445	9476	9507	9537	9568	9598
1940	242 9629	9660	9689	9720	9750	9781	9811	9842	9873	9903	9934	9964
1941	242 9995	*0026	*0054	*0085	*0115	*0146	*0176	*0207	*0238	*0268	*0299	*0329
1942	243 0360	0391	0419	0450	0480	0511	0541	0572	0603	0633	0664	0694
1943	243 0725	0756	0784	0815	0845	0876	0906	0937	0968	0998	1029	1059
1944	243 1090	1121	1150	1181	1211	1242	1272	1303	1334	1364	1395	1425
1945	243 1456	1487	1515	1546	1576	1607	1637	1668	1699	1729	1760	1790
1946	243 1821	1852	1880	1911	1941	1972	2002	2033	2064	2094	2125	2155
1947	243 2186	2217	2245	2276	2306	2337	2367	2398	2429	2459	2490	2520
1948	243 2551	2582	2611	2642	2672	2703	2733	2764	2795	2825	2856	2886
1949	243 2917	2948	2976	3007	3037	3068	3098	3129	3160	3190	3221	3251

The Julian Day Number for each day of the current year is given on pages 2-5.

TABLE III

FOR CONVERTING INTERVALS OF MEAN SOLAR TIME INTO
EQUIVALENT INTERVALS OF SIDEREAL TIME

HOURS			MINUTES				SECONDS				
Mean Time	Equivalent in Sidereal Time		Mean Time	Equivalent in Sidereal Time		Mean Time	Equivalent in Sidereal Time		Mean Time	Equivalent in Sidereal Time	
	^h	^m ^s		^m ^s			^m ^s			^s	
1	1 00	09.856	1	1 00.164	31	31 05.093	1	1.003	31	31.085	
2	2 00	19.713	2	2 00.329	32	32 05.257	2	2.005	32	32.088	
3	3 00	29.569	3	3 00.493	33	33 05.421	3	3.008	33	33.090	
4	4 00	39.426	4	4 00.657	34	34 05.585	4	4.011	34	34.093	
5	5 00	49.282	5	5 00.821	35	35 05.750	5	5.014	35	35.096	
6	6 00	59.139	6	6 00.986	36	36 05.914	6	6.016	36	36.099	
7	7 01	08.995	7	7 01.150	37	37 06.078	7	7.019	37	37.101	
8	8 01	18.852	8	8 01.314	38	38 06.242	8	8.022	38	38.104	
9	9 01	28.708	9	9 01.478	39	39 06.407	9	9.025	39	39.107	
10	10 01	38.565	10	10 01.643	40	40 06.571	10	10.027	40	40.110	
11	11 01	48.421	11	11 01.807	41	41 06.735	11	11.030	41	41.112	
12	12 01	58.278	12	12 01.971	42	42 06.900	12	12.033	42	42.115	
13	13 02	08.134	13	13 02.136	43	43 07.064	13	13.036	43	43.118	
14	14 02	17.991	14	14 02.300	44	44 07.228	14	14.038	44	44.120	
15	15 02	27.847	15	15 02.464	45	45 07.392	15	15.041	45	45.123	
16	16 02	37.704	16	16 02.628	46	46 07.557	16	16.044	46	46.126	
17	17 02	47.560	17	17 02.793	47	47 07.721	17	17.047	47	47.129	
18	18 02	57.417	18	18 02.957	48	48 07.885	18	18.049	48	48.131	
19	19 03	07.273	19	19 03.121	49	49 08.049	19	19.052	49	49.134	
20	20 03	17.129	20	20 03.285	50	50 08.214	20	20.055	50	50.137	
21	21 03	26.986	21	21 03.450	51	51 08.378	21	21.057	51	51.140	
22	22 03	36.842	22	22 03.614	52	52 08.542	22	22.060	52	52.142	
23	23 03	46.699	23	23 03.778	53	53 08.707	23	23.063	53	53.145	
FRACTIONS OF A SECOND			24	24 03.943	54	54 08.871	24	24.066	54	54.148	
The sidereal equivalent of a mean time second is equal to that fraction increased by the			25	25 04.107	55	55 09.035	25	25.068	55	55.151	
			26	26 04.271	56	56 09.199	26	26.071	56	56.153	
			27	27 04.435	57	57 09.364	27	27.074	57	57.156	
			28	28 04.600	58	58 09.528	28	28.077	58	58.159	
			29	29 04.764	59	59 09.692	29	29.079	59	59.162	
			30	30 04.928	60	60 09.856	30	30.082	60	60.164	

FRACTIONS OF A
SECOND

The sidereal equivalent of a fraction of a mean time second is equal to that fraction *increased* by the amount in the following critical table.

Fraction of a Second Amount to be Added

0.000	0.000
0.182	.001
0.547	.002
0.913	.003
1.000	

In critical cases ascend.

Sidereal time *required* = Sidereal time at 0^h + the sidereal equivalent of the *given* mean time.

Example—What is the Greenwich true* sidereal time at 1935 January 11^d 19^h 41^m 22^s.93 G.M.T. ?

True sidereal time at	11 ^d 00 ^h	7 18 17.788
Sidereal equivalent of	19 ^h	19 03 07.273
"	41 ^m	41 06.735
"	22 ^s	22.060
"	08.93	0.933

Sum = required true sidereal time 3 02 54.79

*See page 774. The true sidereal time thus determined includes the effect, at 0^h, of short-period terms of nutation. This effect may be removed, if desired, by subtracting *f'*, the value of *f'* being that at 0^h, not at 19^h 41^m.

TABLE IV

FOR CONVERTING INTERVALS OF SIDEREAL TIME INTO
EQUIVALENT INTERVALS OF MEAN SOLAR TIME

HOURS			MINUTES				SECONDS				
Sidereal Time	Equivalent in Mean Time		Sidereal Time	Equivalent in Mean Time		Sidereal Time	Equivalent in Mean Time		Sidereal Time	Equivalent in Mean Time	
	^h	^m ^s		^m ^s			^s			^s	
1	0	59 50.170	1	0 59.836	31	30 54.921	1	0.997	31	30.915	
2	1	59 40.341	2	1 59.672	32	31 54.758	2	1.995	32	31.913	
3	2	59 30.511	3	2 59.509	33	32 54.594	3	2.992	33	32.910	
4	3	59 20.682	4	3 59.345	34	33 54.430	4	3.989	34	33.907	
5	4	59 10.852	5	4 59.181	35	34 54.266	5	4.986	35	34.904	
6	5	59 01.023	6	5 59.017	36	35 54.102	6	5.984	36	35.902	
7	6	58 51.193	7	6 58.853	37	36 53.938	7	6.981	37	36.899	
8	7	58 41.364	8	7 58.689	38	37 53.775	8	7.978	38	37.896	
9	8	58 31.534	9	8 58.526	39	38 53.611	9	8.975	39	38.893	
10	9	58 21.704	10	9 58.362	40	39 53.447	10	9.973	40	39.891	
11	10	58 11.875	11	10 58.198	41	40 53.283	11	10.970	41	40.888	
12	11	58 02.045	12	11 58.034	42	41 53.119	12	11.967	42	41.885	
13	12	57 52.216	13	12 57.870	43	42 52.956	13	12.964	43	42.883	
14	13	57 42.386	14	13 57.706	44	43 52.792	14	13.962	44	43.880	
15	14	57 32.557	15	14 57.543	45	44 52.628	15	14.959	45	44.877	
16	15	57 22.727	16	15 57.379	46	45 52.464	16	15.956	46	45.874	
17	16	57 12.897	17	16 57.215	47	46 52.300	17	16.954	47	46.872	
18	17	57 03.068	18	17 57.051	48	47 52.136	18	17.951	48	47.869	
19	18	56 53.238	19	18 56.887	49	48 51.973	19	18.948	49	48.866	
20	19	56 43.409	20	19 56.723	50	49 51.809	20	19.945	50	49.863	
21	20	56 33.579	21	20 56.560	51	50 51.645	21	20.943	51	50.861	
22	21	56 23.750	22	21 56.396	52	51 51.481	22	21.940	52	51.858	
23	22	56 13.920	23	22 56.232	53	52 51.317	23	22.937	53	52.855	
FRACTIONS OF A SECOND			24	23 56.068	54	53 51.153	24	23.934	54	53.853	
			25	24 55.904	55	54 50.990	25	24.932	55	54.850	
			26	25 55.741	56	55 50.826	26	25.929	56	55.847	
The mean solar equivalent of a frac- tion of a sidereal second is equal to that fraction di-			27	26 55.577	57	56 50.662	27	26.926	57	56.844	
			28	27 55.413	58	57 50.498	28	27.924	58	57.842	
			29	28 55.249	59	58 50.334	29	28.921	59	58.839	
			30	29 55.085	60	59 50.170	30	29.918	60	59.836	

Mean time required = Mean time of the preceding transit
of the First Point of Aries + the mean time equivalent
of the given sidereal time.

Example—What is the G.M.T. on 1935 January 11 when
the Greenwich true sidereal time is 3^h 02^m 54^s.79?

Transit of the First Point of Aries	^h ^m ^s
Mean time equivalent of 3 ^h	16 38 58.11
" " 2 ^m	2 59 30.511
" " 54 ^s	1 59.672
" " 0 ^s .79	53.853
	0.788
Sum = required mean time	19 41 22.93

If the given true sidereal time includes the effect of short-period
terms of nutation, their effect should, strictly speaking, be
removed by subtracting f' , the value of f' being that at the
moment concerned. In general this refinement is unnecessary.

Fraction of
a Second

Amount to be
Subtracted

0.000	0.000
0.183	.001
0.549	.002
0.915	.003
1.000	

In critical cases ascend.

TABLE V
CONVERSION OF ARC TO TIME

DEGREES						MINUTES			SECONDS					
°	'	"	°	'	"	°	'	"	°	'	"	°	'	"
0	0	00	60	4	00	120	8	00	0	0	00	0	0.000	0.50
1	0	04	61	4	04	121	8	04	1	0	04	1	0.067	0.51
2	0	08	62	4	08	122	8	08	2	0	08	2	0.133	0.52
3	0	12	63	4	12	123	8	12	3	0	12	3	0.200	0.53
4	0	16	64	4	16	124	8	16	4	0	16	4	0.267	0.54
5	0	20	65	4	20	125	8	20	5	0	20	5	0.333	0.55
6	0	24	66	4	24	126	8	24	6	0	24	6	0.400	0.56
7	0	28	67	4	28	127	8	28	7	0	28	7	0.467	0.57
8	0	32	68	4	32	128	8	32	8	0	32	8	0.533	0.58
9	0	36	69	4	36	129	8	36	9	0	36	9	0.600	0.59
10	0	40	70	4	40	130	8	40	10	0	40	10	0.667	0.60
11	0	44	71	4	44	131	8	44	11	0	44	11	0.733	0.61
12	0	48	72	4	48	132	8	48	12	0	48	12	0.800	0.62
13	0	52	73	4	52	133	8	52	13	0	52	13	0.867	0.63
14	0	56	74	4	56	134	8	56	14	0	56	14	0.933	0.64
15	1	00	75	5	00	135	9	00	15	1	00	15	1.000	0.65
16	1	04	76	5	04	136	9	04	16	1	04	16	1.067	0.66
17	1	08	77	5	08	137	9	08	17	1	08	17	1.133	0.67
18	1	12	78	5	12	138	9	12	18	1	12	18	1.200	0.68
19	1	16	79	5	16	139	9	16	19	1	16	19	1.267	0.69
20	1	20	80	5	20	140	9	20	20	1	20	20	1.333	0.70
21	1	24	81	5	24	141	9	24	21	1	24	21	1.400	0.71
22	1	28	82	5	28	142	9	28	22	1	28	22	1.467	0.72
23	1	32	83	5	32	143	9	32	23	1	32	23	1.533	0.73
24	1	36	84	5	36	144	9	36	24	1	36	24	1.600	0.74
25	1	40	85	5	40	145	9	40	25	1	40	25	1.667	0.75
26	1	44	86	5	44	146	9	44	26	1	44	26	1.733	0.76
27	1	48	87	5	48	147	9	48	27	1	48	27	1.800	0.77
28	1	52	88	5	52	148	9	52	28	1	52	28	1.867	0.78
29	1	56	89	5	56	149	9	56	29	1	56	29	1.933	0.79
30	2	00	90	6	00	150	10	00	30	2	00	30	2.000	0.80
31	2	04	91	6	04	151	10	04	31	2	04	31	2.067	0.81
32	2	08	92	6	08	152	10	08	32	2	08	32	2.133	0.82
33	2	12	93	6	12	153	10	12	33	2	12	33	2.200	0.83
34	2	16	94	6	16	154	10	16	34	2	16	34	2.267	0.84
35	2	20	95	6	20	155	10	20	35	2	20	35	2.333	0.85
36	2	24	96	6	24	156	10	24	36	2	24	36	2.400	0.86
37	2	28	97	6	28	157	10	28	37	2	28	37	2.467	0.87
38	2	32	98	6	32	158	10	32	38	2	32	38	2.533	0.88
39	2	36	99	6	36	159	10	36	39	2	36	39	2.600	0.89
40	2	40	100	6	40	160	10	40	40	2	40	40	2.667	0.90
41	2	44	101	6	44	161	10	44	41	2	44	41	2.733	0.91
42	2	48	102	6	48	162	10	48	42	2	48	42	2.800	0.92
43	2	52	103	6	52	163	10	52	43	2	52	43	2.867	0.93
44	2	56	104	6	56	164	10	56	44	2	56	44	2.933	0.94
45	3	00	105	7	00	165	11	00	45	3	00	45	3.000	0.95
46	3	04	106	7	04	166	11	04	46	3	04	46	3.067	0.96
47	3	08	107	7	08	167	11	08	47	3	08	47	3.133	0.97
48	3	12	108	7	12	168	11	12	48	3	12	48	3.200	0.98
49	3	16	109	7	16	169	11	16	49	3	16	49	3.267	0.99
50	3	20	110	7	20	170	11	20	50	3	20	50	3.333	1.00
51	3	24	111	7	24	171	11	24	51	3	24	51	3.400	0.067
52	3	28	112	7	28	172	11	28	52	3	28	52	3.467	
53	3	32	113	7	32	173	11	32	53	3	32	53	3.533	
54	3	36	114	7	36	174	11	36	54	3	36	54	3.600	
55	3	40	115	7	40	175	11	40	55	3	40	55	3.667	
56	3	44	116	7	44	176	11	44	56	3	44	56	3.733	
57	3	48	117	7	48	177	11	48	57	3	48	57	3.800	
58	3	52	118	7	52	178	11	52	58	3	52	58	3.867	
59	3	56	119	7	56	179	11	56	59	3	56	59	3.933	

TABLE VI
CONVERSION OF TIME TO ARC

	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	SECONDS					
0	0 00	15 00	30 00	45 00	60 00	75 00	0	0 00	0.00	0.50	7.50	
1	0 15	15 15	30 15	45 15	60 15	75 15	1	0 15	0.01	0.51	7.65	
2	0 30	15 30	30 30	45 30	60 30	75 30	2	0 30	0.02	0.52	7.80	
3	0 45	15 45	30 45	45 45	60 45	75 45	3	0 45	0.03	0.53	7.95	
4	1 00	16 00	31 00	46 00	61 00	76 00	4	1 00	0.04	0.54	8.10	
5	1 15	16 15	31 15	46 15	61 15	76 15	5	1 15	0.05	0.55	8.25	
6	1 30	16 30	31 30	46 30	61 30	76 30	6	1 30	0.06	0.56	8.40	
7	1 45	16 45	31 45	46 45	61 45	76 45	7	1 45	0.07	0.57	8.55	
8	2 00	17 00	32 00	47 00	62 00	77 00	8	2 00	0.08	0.58	8.70	
9	2 15	17 15	32 15	47 15	62 15	77 15	9	2 15	0.09	0.59	8.85	
10	2 30	17 30	32 30	47 30	62 30	77 30	10	2 30	0.10	0.60	9.00	
11	2 45	17 45	32 45	47 45	62 45	77 45	11	2 45	0.11	0.61	9.15	
12	3 00	18 00	33 00	48 00	63 00	78 00	12	3 00	0.12	0.62	9.30	
13	3 15	18 15	33 15	48 15	63 15	78 15	13	3 15	0.13	0.63	9.45	
14	3 30	18 30	33 30	48 30	63 30	78 30	14	3 30	0.14	0.64	9.60	
15	3 45	18 45	33 45	48 45	63 45	78 45	15	3 45	0.15	0.65	9.75	
16	4 00	19 00	34 00	49 00	64 00	79 00	16	4 00	0.16	0.66	9.90	
17	4 15	19 15	34 15	49 15	64 15	79 15	17	4 15	0.17	0.67	10.05	
18	4 30	19 30	34 30	49 30	64 30	79 30	18	4 30	0.18	0.68	10.20	
19	4 45	19 45	34 45	49 45	64 45	79 45	19	4 45	0.19	0.69	10.35	
20	5 00	20 00	35 00	50 00	65 00	80 00	20	5 00	0.20	0.70	10.50	
21	5 15	20 15	35 15	50 15	65 15	80 15	21	5 15	0.21	0.71	10.65	
22	5 30	20 30	35 30	50 30	65 30	80 30	22	5 30	0.22	0.72	10.80	
23	5 45	20 45	35 45	50 45	65 45	80 45	23	5 45	0.23	0.73	10.95	
24	6 00	21 00	36 00	51 00	66 00	81 00	24	6 00	0.24	0.74	11.10	
25	6 15	21 15	36 15	51 15	66 15	81 15	25	6 15	0.25	0.75	11.25	
26	6 30	21 30	36 30	51 30	66 30	81 30	26	6 30	0.26	0.76	11.40	
27	6 45	21 45	36 45	51 45	66 45	81 45	27	6 45	0.27	0.77	11.55	
28	7 00	22 00	37 00	52 00	67 00	82 00	28	7 00	0.28	0.78	11.70	
29	7 15	22 15	37 15	52 15	67 15	82 15	29	7 15	0.29	0.79	11.85	
30	7 30	22 30	37 30	52 30	67 30	82 30	30	7 30	0.30	0.80	12.00	
31	7 45	22 45	37 45	52 45	67 45	82 45	31	7 45	0.31	0.81	12.15	
32	8 00	23 00	38 00	53 00	68 00	83 00	32	8 00	0.32	0.82	12.30	
33	8 15	23 15	38 15	53 15	68 15	83 15	33	8 15	0.33	0.83	12.45	
34	8 30	23 30	38 30	53 30	68 30	83 30	34	8 30	0.34	0.84	12.60	
35	8 45	23 45	38 45	53 45	68 45	83 45	35	8 45	0.35	0.85	12.75	
36	9 00	24 00	39 00	54 00	69 00	84 00	36	9 00	0.36	0.86	12.90	
37	9 15	24 15	39 15	54 15	69 15	84 15	37	9 15	0.37	0.87	13.05	
38	9 30	24 30	39 30	54 30	69 30	84 30	38	9 30	0.38	0.88	13.20	
39	9 45	24 45	39 45	54 45	69 45	84 45	39	9 45	0.39	0.89	13.35	
40	10 00	25 00	40 00	55 00	70 00	85 00	40	10 00	0.40	0.90	13.50	
41	10 15	25 15	40 15	55 15	70 15	85 15	41	10 15	0.41	0.91	13.65	
42	10 30	25 30	40 30	55 30	70 30	85 30	42	10 30	0.42	0.92	13.80	
43	10 45	25 45	40 45	55 45	70 45	85 45	43	10 45	0.43	0.93	13.95	
44	11 00	26 00	41 00	56 00	71 00	86 00	44	11 00	0.44	0.94	14.10	
45	11 15	26 15	41 15	56 15	71 15	86 15	45	11 15	0.45	0.95	14.25	
46	11 30	26 30	41 30	56 30	71 30	86 30	46	11 30	0.46	0.96	14.40	
47	11 45	26 45	41 45	56 45	71 45	86 45	47	11 45	0.47	0.97	14.55	
48	12 00	27 00	42 00	57 00	72 00	87 00	48	12 00	0.48	0.98	14.70	
49	12 15	27 15	42 15	57 15	72 15	87 15	49	12 15	0.49	0.99	14.85	
50	12 30	27 30	42 30	57 30	72 30	87 30	50	12 30	0.50	1.00	15.00	
51	12 45	27 45	42 45	57 45	72 45	87 45	51	12 45				
52	13 00	28 00	43 00	58 00	73 00	88 00	52	13 00				
53	13 15	28 15	43 15	58 15	73 15	88 15	53	13 15				
54	13 30	28 30	43 30	58 30	73 30	88 30	54	13 30				
55	13 45	28 45	43 45	58 45	73 45	88 45	55	13 45				
56	14 00	29 00	44 00	59 00	74 00	89 00	56	14 00				
57	14 15	29 15	44 15	59 15	74 15	89 15	57	14 15				
58	14 30	29 30	44 30	59 30	74 30	89 30	58	14 30				
59	14 45	29 45	44 45	59 45	74 45	89 45	59	14 45				

h = °
12 = 180
18 = 270

TABLE VII

CONVERSION OF MINUTES AND SECONDS TO DECIMALS OF A DEGREE

	0'	1'	2'	3'	4'	5'		
0	0.00000	0.01667	0.03333	0.05000	0.06667	0.08333	0	0.0
1	0028	1694	3361	5028	6694	8361	6	.1
2	0056	1722	3389	5056	6722	8389	12	.2
3	0083	1750	3417	5083	6750	8417	18	.3
4	0111	1778	3444	5111	6778	8444	24	.4
5	0.00139	0.01806	0.03472	0.05139	0.06806	0.08472	30	0.5
6	0167	1833	3500	5167	6833	8500	36	.6
7	0194	1861	3528	5194	6861	8528	42	.7
8	0222	1889	3556	5222	6889	8556	48	.8
9	0250	1917	3583	5250	6917	8583	54	.9
10	0.00278	0.01944	0.03611	0.05278	0.06944	0.08611	In units of the fifth decimal of a degree.	
11	0306	1972	3639	5306	6972	8639		
12	0333	2000	3667	5333	7000	8667		
13	0361	2028	3694	5361	7028	8694		
14	0389	2056	3722	5389	7056	8722		
15	0.00417	0.02083	0.03750	0.05417	0.07083	0.08750		
16	0444	2111	3778	5444	7111	8778		
17	0472	2139	3806	5472	7139	8806		
18	0500	2167	3833	5500	7167	8833		
19	0528	2194	3861	5528	7194	8861		
20	0.00556	0.02222	0.03889	0.05556	0.07222	0.08889		
21	0583	2250	3917	5583	7250	8917		
22	0611	2278	3944	5611	7278	8944		
23	0639	2306	3972	5639	7306	8972		
24	0667	2333	4000	5667	7333	9000		
25	0.00694	0.02361	0.04028	0.05694	0.07361	0.09028		
26	0722	2389	4056	5722	7389	9056		
27	0750	2417	4083	5750	7417	9083		
28	0778	2444	4111	5778	7444	9111		
29	0806	2472	4139	5806	7472	9139		
30	0.00833	0.02500	0.04167	0.05833	0.07500	0.09167		
31	0861	2528	4194	5861	7528	9194		
32	0889	2556	4222	5889	7556	9222		
33	0917	2583	4250	5917	7583	9250		
34	0944	2611	4278	5944	7611	9278		
35	0.00972	0.02639	0.04306	0.05972	0.07639	0.09306		
36	1000	2667	4333	6000	7667	9333		
37	1028	2694	4361	6028	7694	9361		
38	1056	2722	4389	6056	7722	9389		
39	1083	2750	4417	6083	7750	9417		
40	0.01111	0.02778	0.04444	0.06111	0.07778	0.09444		
41	1139	2806	4472	6139	7806	9472		
42	1167	2833	4500	6167	7833	9500		
43	1194	2861	4528	6194	7861	9528		
44	1222	2889	4556	6222	7889	9556		
45	0.01250	0.02917	0.04583	0.06250	0.07917	0.09583		
46	1278	2944	4611	6278	7944	9611		
47	1306	2972	4639	6306	7972	9639		
48	1333	3000	4667	6333	8000	9667		
49	1361	3028	4694	6361	8028	9694		
50	0.01389	0.03056	0.04722	0.06389	0.08056	0.09722		
51	1417	3083	4750	6417	8083	9750		
52	1444	3111	4778	6444	8111	9778		
53	1472	3139	4806	6472	8139	9806		
54	1500	3167	4833	6500	8167	9833		
55	0.01528	0.03194	0.04861	0.06528	0.08194	0.09861		
56	1556	3222	4889	6556	8222	9889		
57	1583	3250	4917	6583	8250	9917		
58	1611	3278	4944	6611	8278	9944		
59	1639	3306	4972	6639	8306	9972		

In critical
cases ascend.

TABLE VIII

CONVERSION OF DECIMALS OF A DEGREE TO MINUTES AND SECONDS

0.000	0 00.0	0.050	3 00.0	0.00000	0.00	0.00050	1.80
01	0 03.6	51	3 03.6	01	0.04	51	1.84
02	0 07.2	52	3 07.2	02	0.07	52	1.87
03	0 10.8	53	3 10.8	03	0.11	53	1.91
04	0 14.4	54	3 14.4	04	0.14	54	1.94
0.005	0 18.0	0.055	3 18.0	0.00005	0.18	0.00055	1.98
06	0 21.6	56	3 21.6	06	0.22	56	2.02
07	0 25.2	57	3 25.2	07	0.25	57	2.05
08	0 28.8	58	3 28.8	08	0.29	58	2.09
09	0 32.4	59	3 32.4	09	0.32	59	2.12
0.010	0 36.0	0.060	3 36.0	0.00010	0.36	0.00060	2.16
11	0 39.6	61	3 39.6	11	0.40	61	2.20
12	0 43.2	62	3 43.2	12	0.43	62	2.23
13	0 46.8	63	3 46.8	13	0.47	63	2.27
14	0 50.4	64	3 50.4	14	0.50	64	2.30
0.015	0 54.0	0.065	3 54.0	0.00015	0.54	0.00065	2.34
16	0 57.6	66	3 57.6	16	0.58	66	2.38
17	1 01.2	67	4 01.2	17	0.61	67	2.41
18	1 04.8	68	4 04.8	18	0.65	68	2.45
19	1 08.4	69	4 08.4	19	0.68	69	2.48
0.020	1 12.0	0.070	4 12.0	0.00020	0.72	0.00070	2.52
21	1 15.6	71	4 15.6	21	0.76	71	2.56
22	1 19.2	72	4 19.2	22	0.79	72	2.59
23	1 22.8	73	4 22.8	23	0.83	73	2.63
24	1 26.4	74	4 26.4	24	0.86	74	2.66
0.025	1 30.0	0.075	4 30.0	0.00025	0.90	0.00075	2.70
26	1 33.6	76	4 33.6	26	0.94	76	2.74
27	1 37.2	77	4 37.2	27	0.97	77	2.77
28	1 40.8	78	4 40.8	28	1.01	78	2.81
29	1 44.4	79	4 44.4	29	1.04	79	2.84
0.030	1 48.0	0.080	4 48.0	0.00030	1.08	0.00080	2.88
31	1 51.6	81	4 51.6	31	1.12	81	2.92
32	1 55.2	82	4 55.2	32	1.15	82	2.95
33	1 58.8	83	4 58.8	33	1.19	83	2.99
34	2 02.4	84	5 02.4	34	1.22	84	3.02
0.035	2 06.0	0.085	5 06.0	0.00035	1.26	0.00085	3.06
36	2 09.6	86	5 09.6	36	1.30	86	3.10
37	2 13.2	87	5 13.2	37	1.33	87	3.13
38	2 16.8	88	5 16.8	38	1.37	88	3.17
39	2 20.4	89	5 20.4	39	1.40	89	3.20
0.040	2 24.0	0.090	5 24.0	0.00040	1.44	0.00090	3.24
41	2 27.6	91	5 27.6	41	1.48	91	3.28
42	2 31.2	92	5 31.2	42	1.51	92	3.31
43	2 34.8	93	5 34.8	43	1.55	93	3.35
44	2 38.4	94	5 38.4	44	1.58	94	3.38
0.045	2 42.0	0.095	5 42.0	0.00045	1.62	0.00095	3.42
46	2 45.6	96	5 45.6	46	1.66	96	3.46
47	2 49.2	97	5 49.2	47	1.69	97	3.49
48	2 52.8	98	5 52.8	48	1.73	98	3.53
49	2 56.4	99	5 56.4	49	1.76	99	3.56

TABLE IX

CONVERSION OF HOURS, MINUTES AND SECONDS INTO DECIMALS
OF A DAY

	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	SECONDS	
m	^d	^d	^d	^d	^d	^d	^s	^d
0	0.00000	0.04167	0.08333	0.12500	0.16667	0.20833	0	0.00000
1	.00069	.04236	.08403	.12569	.16736	.20903	1	.00001
2	.00139	.04306	.08472	.12639	.16806	.20972	2	.00002
3	.00208	.04375	.08542	.12708	.16875	.21042	3	.00003
4	.00278	.04444	.08611	.12778	.16944	.21111	4	.00005
5	0.00347	0.04514	0.08681	0.12847	0.17014	0.21181	5	0.00006
6	.00417	.04583	.08750	.12917	.17083	.21250	6	.00007
7	.00486	.04653	.08819	.12986	.17153	.21319	7	.00008
8	.00556	.04722	.08889	.13056	.17222	.21389	8	.00009
9	.00625	.04792	.08958	.13125	.17292	.21458	9	.00010
10	0.00694	0.04861	0.09028	0.13194	0.17361	0.21528	10	0.00012
11	.00764	.04931	.09097	.13264	.17431	.21597	11	.00013
12	.00833	.05000	.09167	.13333	.17500	.21667	12	.00014
13	.00903	.05069	.09236	.13403	.17569	.21736	13	.00015
14	.00972	.05139	.09306	.13472	.17639	.21806	14	.00016
15	0.01042	0.05208	0.09375	0.13542	0.17708	0.21875	15	0.00017
16	.01111	.05278	.09444	.13611	.17778	.21944	16	.00019
17	.01181	.05347	.09514	.13681	.17847	.22014	17	.00020
18	.01250	.05417	.09583	.13750	.17917	.22083	18	.00021
19	.01319	.05486	.09653	.13819	.17986	.22153	19	.00022
20	0.01389	0.05556	0.09722	0.13889	0.18056	0.22222	20	0.00023
21	.01458	.05625	.09792	.13958	.18125	.22292	21	.00024
22	.01528	.05694	.09861	.14028	.18194	.22361	22	.00025
23	.01597	.05764	.09931	.14097	.18264	.22431	23	.00027
24	.01667	.05833	.10000	.14167	.18333	.22500	24	.00028
25	0.01736	0.05903	0.10069	0.14236	0.18403	0.22569	25	0.00029
26	.01806	.05972	.10139	.14306	.18472	.22639	26	.00030
27	.01875	.06042	.10208	.14375	.18542	.22708	27	.00031
28	.01944	.06111	.10278	.14444	.18611	.22778	28	.00032
29	.02014	.06181	.10347	.14514	.18681	.22847	29	.00034
30	0.02083	0.06250	0.10417	0.14583	0.18750	0.22917	30	0.00035
31	.02153	.06319	.10486	.14653	.18819	.22986	31	.00036
32	.02222	.06389	.10556	.14722	.18889	.23056	32	.00037
33	.02292	.06458	.10625	.14792	.18958	.23125	33	.00038
34	.02361	.06528	.10694	.14861	.19028	.23194	34	.00039
35	0.02431	0.06597	0.10764	0.14931	0.19097	0.23264	35	0.00041
36	.02500	.06667	.10833	.15000	.19167	.23333	36	.00042
37	.02569	.06736	.10903	.15069	.19236	.23403	37	.00043
38	.02639	.06806	.10972	.15139	.19306	.23472	38	.00044
39	.02708	.06875	.11042	.15208	.19375	.23542	39	.00045
40	0.02778	0.06944	0.11111	0.15278	0.19444	0.23611	40	0.00046
41	.02847	.07014	.11181	.15347	.19514	.23681	41	.00047
42	.02917	.07083	.11250	.15417	.19583	.23750	42	.00049
43	.02986	.07153	.11319	.15486	.19653	.23819	43	.00050
44	.03056	.07222	.11389	.15556	.19722	.23889	44	.00051
45	0.03125	0.07292	0.11458	0.15625	0.19792	0.23958	45	0.00052
46	.03194	.07361	.11528	.15694	.19861	.24028	46	.00053
47	.03264	.07431	.11597	.15764	.19931	.24097	47	.00054
48	.03333	.07500	.11667	.15833	.20000	.24167	48	.00056
49	.03403	.07569	.11736	.15903	.20069	.24236	49	.00057
50	0.03472	0.07639	0.11806	0.15972	0.20139	0.24306	50	0.00058
51	.03542	.07708	.11875	.16042	.20208	.24375	51	.00059
52	.03611	.07778	.11944	.16111	.20278	.24444	52	.00060
53	.03681	.07847	.12014	.16181	.20347	.24514	53	.00061
54	.03750	.07917	.12083	.16250	.20417	.24583	54	.00062
55	0.03819	0.07986	0.12153	0.16319	0.20486	0.24653	55	0.00064
56	.03889	.08056	.12222	.16389	.20556	.24722	56	.00065
57	.03958	.08125	.12292	.16458	.20625	.24792	57	.00066
58	.04028	.08194	.12361	.16528	.20694	.24861	58	.00067
59	0.04097	0.08264	0.12431	0.16597	0.20764	0.24931	59	0.00068

TABLE IX 725
CONVERSION OF HOURS, MINUTES AND SECONDS INTO DECIMALS
OF A DAY

	6 ^h	7 ^h	8 ^h	9 ^h	10 ^h	11 ^h	SECONDS	
m	^d	^d	^d	^d	^d	^d	^s	^d
0	0.25000	0.29167	0.33333	0.37500	0.41667	0.45833	0	0.00000
1	.25069	.29236	.33403	.37569	.41736	.45903	1	.00001
2	.25139	.29306	.33472	.37639	.41806	.45972	2	.00002
3	.25208	.29375	.33542	.37708	.41875	.46042	3	.00003
4	.25278	.29444	.33611	.37778	.41944	.46111	4	.00005
5	0.25347	0.29514	0.33681	0.37847	0.42014	0.46181	5	0.00006
6	.25417	.29583	.33750	.37917	.42083	.46250	6	.00007
7	.25486	.29653	.33819	.37986	.42153	.46319	7	.00008
8	.25556	.29722	.33889	.38056	.42222	.46389	8	.00009
9	.25625	.29792	.33958	.38125	.42292	.46458	9	.00010
10	0.25694	0.29861	0.34028	0.38194	0.42361	0.46528	10	0.00012
11	.25764	.29931	.34097	.38264	.42431	.46597	11	.00013
12	.25833	.30000	.34167	.38333	.42500	.46667	12	.00014
13	.25903	.30069	.34236	.38403	.42569	.46736	13	.00015
14	.25972	.30139	.34306	.38472	.42639	.46806	14	.00016
15	0.26042	0.30208	0.34375	0.38542	0.42708	0.46875	15	0.00017
16	.26111	.30278	.34444	.38611	.42778	.46944	16	.00019
17	.26181	.30347	.34514	.38681	.42847	.47014	17	.00020
18	.26250	.30417	.34583	.38750	.42917	.47083	18	.00021
19	.26319	.30486	.34653	.38819	.42986	.47153	19	.00022
20	0.26389	0.30556	0.34722	0.38889	0.43056	0.47222	20	0.00023
21	.26458	.30625	.34792	.38958	.43125	.47292	21	.00024
22	.26528	.30694	.34861	.39028	.43194	.47361	22	.00025
23	.26597	.30764	.34931	.39097	.43264	.47431	23	.00027
24	.26667	.30833	.35000	.39167	.43333	.47500	24	.00028
25	0.26736	0.30903	0.35069	0.39236	0.43403	0.47569	25	0.00029
26	.26806	.30972	.35139	.39306	.43472	.47639	26	.00030
27	.26875	.31042	.35208	.39375	.43542	.47708	27	.00031
28	.26944	.31111	.35278	.39444	.43611	.47778	28	.00032
29	.27014	.31181	.35347	.39514	.43681	.47847	29	.00034
30	0.27083	0.31250	0.35417	0.39583	0.43750	0.47917	30	0.00035
31	.27153	.31319	.35486	.39653	.43819	.47986	31	.00036
32	.27222	.31389	.35556	.39722	.43889	.48056	32	.00037
33	.27292	.31458	.35625	.39792	.43958	.48125	33	.00038
34	.27361	.31528	.35694	.39861	.44028	.48194	34	.00039
35	0.27431	0.31597	0.35764	0.39931	0.44097	0.48264	35	0.00041
36	.27500	.31667	.35833	.40000	.44167	.48333	36	.00042
37	.27569	.31736	.35903	.40069	.44236	.48403	37	.00043
38	.27639	.31806	.35972	.40139	.44306	.48472	38	.00044
39	.27708	.31875	.36042	.40208	.44375	.48542	39	.00045
40	0.27778	0.31944	0.36111	0.40278	0.44444	0.48611	40	0.00046
41	.27847	.32014	.36181	.40347	.44514	.48681	41	.00047
42	.27917	.32083	.36250	.40417	.44583	.48750	42	.00049
43	.27986	.32153	.36319	.40486	.44653	.48819	43	.00050
44	.28056	.32222	.36389	.40556	.44722	.48889	44	.00051
45	0.28125	0.32292	0.36458	0.40625	0.44792	0.48958	45	0.00052
46	.28194	.32361	.36528	.40694	.44861	.49028	46	.00053
47	.28264	.32431	.36597	.40764	.44931	.49097	47	.00054
48	.28333	.32500	.36667	.40833	.45000	.49167	48	.00056
49	.28403	.32569	.36736	.40903	.45069	.49236	49	.00057
50	0.28472	0.32639	0.36806	0.40972	0.45139	0.49306	50	0.00058
51	.28542	.32708	.36875	.41042	.45208	.49375	51	.00059
52	.28611	.32778	.36944	.41111	.45278	.49444	52	.00060
53	.28681	.32847	.37014	.41181	.45347	.49514	53	.00061
54	.28750	.32917	.37083	.41250	.45417	.49583	54	.00062
55	0.28819	0.32986	0.37153	0.41319	0.45486	0.49653	55	0.00064
56	.28889	.33056	.37222	.41389	.45556	.49722	56	.00065
57	.28958	.33125	.37292	.41458	.45625	.49792	57	.00066
58	.29028	.33194	.37361	.41528	.45694	.49861	58	.00067
59	0.29097	0.33264	0.37431	0.41597	0.45764	0.49931	59	0.00068

TABLE X

FOR COMPUTING THE GEOCENTRIC CO-ORDINATES OF A PLACE

ϕ	S	C	ϕ	S	C
± 0	0.993277 ⁺¹	1.000000 ⁺¹	± 30	0.994113 ⁺⁵¹	1.000841 ⁺⁵²
1	.993278 ³	.000001 ³	31	.994164 ⁵²	.000893 ⁵²
2	.993281 ⁵	.000004 ⁵	32	.994216 ⁵³	.000945 ⁵⁴
3	.993286 ⁸	.000009 ⁷	33	.994269 ⁵⁴	.000999 ⁵⁴
4	.993294 ⁹	.000016 ¹⁰	34	.994323 ⁵⁵	.001053 ⁵⁵
5	0.993303 ⁺¹¹	1.000026 ⁺¹¹	35	0.994378 ⁺⁵⁵	1.001108 ⁺⁵⁵
6	.993314 ¹³	.000037 ¹³	36	.994433 ⁵⁶	.001163 ⁵⁷
7	.993327 ¹⁵	.000050 ¹⁵	37	.994489 ⁵⁶	.001220 ⁵⁷
8	.993342 ¹⁷	.000065 ¹⁷	38	.994545 ⁵⁷	.001277 ⁵⁷
9	.993359 ¹⁹	.000082 ¹⁹	39	.994602 ⁵⁸	.001334 ⁵⁸
10	0.993378 ⁺²¹	1.000101 ⁺²¹	40	0.994660 ⁺⁵⁷	1.001392 ⁺⁵⁸
11	.993399 ²³	.000122 ²³	41	.994717 ⁵⁹	.001450 ⁵⁸
12	.993422 ²⁴	.000145 ²⁵	42	.994776 ⁵⁸	.001508 ⁵⁹
13	.993446 ²⁷	.000170 ²⁷	43	.994834 ⁵⁸	.001567 ⁵⁹
14	.993473 ²⁸	.000197 ²⁸	44	.994892 ⁵⁹	.001626 ⁵⁹
15	0.993501 ⁺³⁰	1.000225 ⁺³⁰	45	0.994951 ⁺⁵⁸	1.001685 ⁺⁵⁹
16	.993531 ³²	.000255 ³²	46	.995009 ⁵⁹	.001744 ⁵⁹
17	.993563 ³³	.000287 ³⁴	47	.995068 ⁵⁸	.001803 ⁵⁹
18	.993596 ³⁵	.000321 ³⁵	48	.995126 ⁵⁹	.001862 ⁵⁸
19	.993631 ³⁷	.000356 ³⁷	49	.995185 ⁵⁷	.001920 ⁵⁸
20	0.993668 ⁺³⁸	1.000393 ⁺³⁹	50	0.995242 ⁺⁵⁸	1.001978 ⁺⁵⁸
21	.993706 ⁴⁰	.000432 ⁴⁰	51	.995300 ⁵⁷	.002036 ⁵⁸
22	.993746 ⁴¹	.000472 ⁴²	52	.995357 ⁵⁷	.002094 ⁵⁷
23	.993787 ⁴³	.000514 ⁴³	53	.995414 ⁵⁶	.002151 ⁵⁶
24	.993830 ⁴⁴	.000557 ⁴⁴	54	.995470 ⁵⁵	.002207 ⁵⁶
25	0.993874 ⁺⁴⁶	1.000601 ⁺⁴⁶	55	0.995525 ⁺⁵⁵	1.002263 ⁺⁵⁵
26	.993920 ⁴⁶	.000647 ⁴⁷	56	.995580 ⁵⁴	.002318 ⁵⁵
27	.993966 ⁴⁸	.000694 ⁴⁸	57	.995634 ⁵³	.002373 ⁵³
28	.994014 ⁴⁹	.000742 ⁴⁹	58	.995687 ⁵³	.002426 ⁵³
29	.994063 ⁺⁵⁰	.000791 ⁺⁵⁰	59	.995740 ⁺⁵¹	.002479 ⁺⁵²
± 30	0.994113	1.000841	± 60	0.995791	1.002531

Let ϕ = Geographical latitude ϕ' = Geocentric latitude ρ = Geocentric radius h = Altitude above sea level in metres H = Altitude above sea level in feet

Then—

$$\rho \sin \phi' = (S + 10^{-8} \cdot 0.1568h) \sin \phi$$

$$= (S + 10^{-8} \cdot 0.0478H) \sin \phi$$

$$\rho \cos \phi' = (C + 10^{-8} \cdot 0.1568h) \cos \phi$$

$$= (C + 10^{-8} \cdot 0.0478H) \cos \phi$$

$$\tan \phi' = (0.993277 + 10^{-8} \cdot 0.0011h) \tan \phi$$

$$= (0.993277 + 10^{-8} \cdot 0.0003H) \tan \phi$$

$$\frac{d \rho \sin \phi'}{d \phi} = S C^2 \cos \phi = S C \rho \cos \phi'$$

$$\frac{d \rho \cos \phi'}{d \phi} = -S C^2 \sin \phi = -C^2 \rho \sin \phi'$$

$$\frac{d \tan \phi'}{d \phi} = 0.9933 \sec^2 \phi$$

TABLE XI

727

FOR COMPUTING THE GEOCENTRIC CO-ORDINATES OF A PLACE

ϕ	log S	log C	ϕ	log S	log C
$\pm 0^\circ$	9.997071 ⁺ 0	0.000000 ⁺ 0	$\pm 30^\circ$	9.997436 ⁺ 22	0.000365 ⁺ 23
1	.997071 ⁺ 1	.000000 ⁺ 0	31	.997458 ⁺ 22	.000388 ⁺ 23
2	.997072 ⁺ 2	.000002 ⁺ 2	32	.997481 ⁺ 23	.000410 ⁺ 23
3	.997075 ⁺ 3	.000004 ⁺ 3	33	.997504 ⁺ 23	.000433 ⁺ 24
4	.997078 ⁺ 4	.000007 ⁺ 4	34	.997527 ⁺ 24	.000457 ⁺ 24
5	9.997082 ⁺ 5	0.000011 ⁺ 5	35	9.997551 ⁺ 24	0.000481 ⁺ 24
6	.997086 ⁺ 6	.000016 ⁺ 6	36	.997575 ⁺ 25	.000505 ⁺ 24
7	.997092 ⁺ 7	.000022 ⁺ 6	37	.997600 ⁺ 25	.000529 ⁺ 25
8	.997099 ⁺ 7	.000028 ⁺ 8	38	.997625 ⁺ 25	.000554 ⁺ 25
9	.997106 ⁺ 9	.000036 ⁺ 8	39	.997649 ⁺ 26	.000579 ⁺ 25
10	9.997115 ⁺ 9	0.000044 ⁺ 9	40	9.997675 ⁺ 25	0.000604 ⁺ 25
11	.997124 ⁺ 10	.000053 ⁺ 10	41	.997700 ⁺ 25	.000629 ⁺ 26
12	.997134 ⁺ 10	.000063 ⁺ 11	42	.997725 ⁺ 26	.000655 ⁺ 25
13	.997144 ⁺ 12	.000074 ⁺ 11	43	.997751 ⁺ 25	.000680 ⁺ 26
14	.997156 ⁺ 12	.000085 ⁺ 13	44	.997776 ⁺ 26	.000706 ⁺ 25
15	9.997168 ⁺ 13	0.000098 ⁺ 13	45	9.997802 ⁺ 25	0.000731 ⁺ 26
16	.997181 ⁺ 14	.000111 ⁺ 14	46	.997827 ⁺ 26	.000757 ⁺ 25
17	.997195 ⁺ 15	.000125 ⁺ 14	47	.997853 ⁺ 25	.000782 ⁺ 26
18	.997210 ⁺ 15	.000139 ⁺ 16	48	.997878 ⁺ 26	.000808 ⁺ 25
19	.997225 ⁺ 16	.000155 ⁺ 16	49	.997904 ⁺ 25	.000833 ⁺ 25
20	9.997241 ⁺ 17	0.000171 ⁺ 17	50	9.997929 ⁺ 25	0.000858 ⁺ 25
21	.997258 ⁺ 17	.000188 ⁺ 17	51	.997954 ⁺ 25	.000883 ⁺ 25
22	.997275 ⁺ 19	.000205 ⁺ 18	52	.997979 ⁺ 25	.000908 ⁺ 25
23	.997294 ⁺ 18	.000223 ⁺ 19	53	.998004 ⁺ 24	.000933 ⁺ 25
24	.997312 ⁺ 19	.000242 ⁺ 19	54	.998028 ⁺ 24	.000958 ⁺ 24
25	9.997331 ⁺ 20	0.000261 ⁺ 20	55	9.998052 ⁺ 24	0.000982 ⁺ 24
26	.997351 ⁺ 21	.000281 ⁺ 20	56	.998076 ⁺ 24	.001006 ⁺ 23
27	.997372 ⁺ 21	.000301 ⁺ 21	57	.998100 ⁺ 23	.001029 ⁺ 23
28	.997393 ⁺ 21	.000322 ⁺ 21	58	.998123 ⁺ 23	.001052 ⁺ 23
29	.997414 ⁺ 22	.000343 ⁺ 22	59	.998146 ⁺ 23	.001075 ⁺ 23
$\pm 30^\circ$	9.997436	0.000365	$\pm 60^\circ$	9.998168	0.001098

Let ϕ = Geographical latitude ϕ' = Geocentric latitude ρ = Geocentric radius h = Altitude above sea level in metres H = Altitude above sea level in feet

Then—

 $\log \rho \sin \phi' = \log \sin \phi + \log S + f \times \text{altitude}$ $\log \rho \cos \phi' = \log \cos \phi + \log C + g \times \text{altitude}$ $\log \tan \phi' = \log \tan \phi + 9.997071 + 10^{-8} \times 0.0005h \text{ (or } 0.0001H)$

In units of 6th decimal. For altitude in—

Metres			Feet		Metres			Feet	
ϕ	f	g	f	g	ϕ	f	g	f	g
0°	0.0685	0.0681	0.0209	0.0208	30°	0.0685	0.0680	0.0209	0.0207
10	0.0685	0.0681	0.0209	0.0208	40	0.0685	0.0680	0.0209	0.0207
20	0.0685	0.0681	0.0209	0.0207	50	0.0684	0.0680	0.0209	0.0207
30	0.0685	0.0680	0.0209	0.0207	60	0.0684	0.0679	0.0208	0.0207

TABLE XII
PRECESSION IN RIGHT ASCENSION AND DECLINATION

δ		p_a														p_δ
		0°	10°	20°	30°	40°	45°	50°	52°	54°	56°	58°	60°			
a	a															
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	
0 00	12 00	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	20.0	
0 10	11 50	3.07	3.08	3.09	3.11	3.12	3.13	3.14	3.15	3.15	3.16	3.17	3.17	3.17	20.0	
0 20	11 40	3.07	3.09	3.12	3.14	3.17	3.19	3.21	3.22	3.23	3.25	3.26	3.27	3.27	20.0	
0 30	11 30	3.07	3.10	3.14	3.17	3.22	3.25	3.28	3.30	3.31	3.33	3.35	3.38	3.38	19.9	
0 40	11 20	3.07	3.11	3.16	3.21	3.27	3.31	3.35	3.37	3.39	3.42	3.44	3.47	3.47	19.7	
0 50	11 10	3.07	3.12	3.18	3.24	3.32	3.36	3.42	3.44	3.47	3.50	3.54	3.57	3.57	19.6	
1 00	11 00	3.07	3.13	3.20	3.27	3.36	3.42	3.49	3.52	3.55	3.59	3.63	3.67	3.67	19.4	
1 10	10 50	3.07	3.14	3.22	3.30	3.41	3.47	3.55	3.59	3.63	3.67	3.72	3.77	3.77	19.1	
1 20	10 40	3.07	3.15	3.24	3.34	3.46	3.53	3.62	3.66	3.70	3.75	3.80	3.86	3.86	18.8	
1 30	10 30	3.07	3.16	3.26	3.37	3.50	3.58	3.68	3.73	3.78	3.83	3.89	3.96	3.96	18.5	
1 40	10 20	3.07	3.17	3.28	3.40	3.55	3.64	3.75	3.80	3.85	3.91	3.98	4.05	4.05	18.2	
1 50	10 10	3.07	3.18	3.30	3.43	3.59	3.69	3.81	3.86	3.92	3.99	4.06	4.14	4.14	17.8	
2 00	10 00	3.07	3.19	3.32	3.46	3.63	3.74	3.87	3.93	3.99	4.06	4.14	4.23	4.23	17.4	
2 10	9 50	3.07	3.20	3.33	3.49	3.68	3.79	3.93	3.99	4.06	4.14	4.22	4.32	4.32	16.9	
2 20	9 40	3.07	3.21	3.35	3.52	3.72	3.84	3.99	4.05	4.13	4.21	4.30	4.40	4.40	16.4	
2 30	9 30	3.07	3.22	3.37	3.54	3.75	3.89	4.04	4.11	4.19	4.28	4.37	4.48	4.48	15.9	
2 40	9 20	3.07	3.22	3.39	3.57	3.79	3.93	4.10	4.17	4.26	4.35	4.45	4.56	4.56	15.4	
2 50	9 10	3.07	3.23	3.40	3.59	3.83	3.98	4.15	4.23	4.32	4.41	4.52	4.64	4.64	14.8	
3 00	9 00	3.07	3.24	3.42	3.62	3.87	4.02	4.20	4.28	4.37	4.47	4.59	4.71	4.71	14.2	
3 10	8 50	3.07	3.25	3.43	3.64	3.90	4.06	4.25	4.33	4.43	4.53	4.65	4.78	4.78	13.5	
3 20	8 40	3.07	3.25	3.45	3.66	3.93	4.10	4.29	4.38	4.48	4.59	4.71	4.85	4.85	12.9	
3 30	8 30	3.07	3.26	3.46	3.68	3.96	4.13	4.34	4.43	4.53	4.64	4.77	4.91	4.91	12.2	
3 40	8 20	3.07	3.27	3.47	3.70	3.99	4.17	4.38	4.47	4.58	4.70	4.82	4.97	4.97	11.5	
3 50	8 10	3.07	3.27	3.48	3.72	4.02	4.20	4.42	4.51	4.62	4.74	4.88	5.02	5.02	10.8	
4 00	8 00	3.07	3.28	3.49	3.74	4.04	4.23	4.45	4.55	4.67	4.79	4.93	5.08	5.08	10.0	
4 10	7 50	3.07	3.28	3.50	3.76	4.07	4.26	4.49	4.59	4.70	4.83	4.97	5.13	5.13	9.3	
4 20	7 40	3.07	3.29	3.51	3.77	4.09	4.28	4.52	4.62	4.74	4.87	5.01	5.17	5.17	8.5	
4 30	7 30	3.07	3.29	3.52	3.79	4.11	4.31	4.54	4.65	4.77	4.90	5.05	5.21	5.21	7.7	
4 40	7 20	3.07	3.29	3.53	3.80	4.13	4.33	4.57	4.68	4.80	4.93	5.08	5.25	5.25	6.9	
4 50	7 10	3.07	3.30	3.54	3.81	4.14	4.35	4.59	4.70	4.83	4.96	5.11	5.28	5.28	6.0	
5 00	7 00	3.07	3.30	3.54	3.82	4.16	4.36	4.61	4.72	4.85	4.99	5.14	5.31	5.31	5.2	
5 10	6 50	3.07	3.30	3.55	3.83	4.17	4.38	4.63	4.74	4.87	5.01	5.16	5.33	5.33	4.3	
5 20	6 40	3.07	3.31	3.55	3.83	4.18	4.39	4.64	4.76	4.88	5.02	5.18	5.35	5.35	3.5	
5 30	6 30	3.07	3.31	3.56	3.84	4.18	4.40	4.65	4.77	4.90	5.04	5.19	5.37	5.37	2.6	
5 40	6 20	3.07	3.31	3.56	3.84	4.19	4.40	4.66	4.78	4.91	5.05	5.20	5.38	5.38	1.8	
5 50	6 10	3.07	3.31	3.56	3.84	4.19	4.41	4.66	4.78	4.91	5.05	5.21	5.39	5.39	0.9	
6 00	6 00	3.07	3.31	3.56	3.84	4.19	4.41	4.67	4.78	4.91	5.05	5.21	5.39	5.39	0.0	

The above table is for northern declinations. For southern declinations use as argument $a \pm 12^h$.

The table is based on the formulæ

$$p_a = 3^s.0730 + 1^s.3362 \sin a \tan \delta$$
$$p_\delta = 20''.043 \cos a$$

For more extended tables of precession in right ascension and declination the *Präzessions-Tafeln* of Richard Schorr, Director of the Hamburg Observatory in Bergedorf, may be consulted.

Sign of
 p_δ
h
o
+
6
-
18
+
24

TABLE XII

729

PRECESSION IN RIGHT ASCENSION AND DECLINATION

p_α															p_δ
δ		0°	10°	20°	30°	40°	45°	50°	52°	54°	56°	58°	60°		
α															
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	
12 00	24 00	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	20.0	
12 10	23 50	3.07	3.06	3.05	3.04	3.02	3.01	3.00	3.00	2.99	2.99	2.98	2.97	20.0	
12 20	23 40	3.07	3.05	3.03	3.01	2.98	2.96	2.93	2.92	2.91	2.90	2.89	2.87	20.0	
12 30	23 30	3.07	3.04	3.01	2.97	2.93	2.90	2.87	2.85	2.83	2.81	2.79	2.77	19.9	
12 40	23 20	3.07	3.03	2.99	2.94	2.88	2.84	2.80	2.78	2.75	2.73	2.70	2.67	19.7	
12 50	23 10	3.07	3.02	2.97	2.91	2.83	2.78	2.73	2.70	2.67	2.64	2.61	2.57	19.6	
13 00	23 00	3.07	3.01	2.95	2.87	2.78	2.73	2.66	2.63	2.60	2.56	2.52	2.47	19.4	
13 10	22 50	3.07	3.00	2.93	2.84	2.74	2.67	2.59	2.56	2.52	2.48	2.43	2.38	19.1	
13 20	22 40	3.07	2.99	2.91	2.81	2.69	2.62	2.53	2.49	2.44	2.40	2.34	2.28	18.8	
13 30	22 30	3.07	2.98	2.89	2.78	2.64	2.56	2.46	2.42	2.37	2.32	2.25	2.19	18.5	
13 40	22 20	3.07	2.97	2.87	2.75	2.60	2.51	2.40	2.35	2.30	2.24	2.17	2.09	18.2	
13 50	22 10	3.07	2.96	2.85	2.72	2.56	2.46	2.34	2.28	2.22	2.16	2.08	2.00	17.8	
14 00	22 00	3.07	2.96	2.83	2.69	2.51	2.40	2.28	2.22	2.15	2.08	2.00	1.92	17.4	
14 10	21 50	3.07	2.95	2.81	2.66	2.47	2.35	2.22	2.15	2.08	2.01	1.92	1.83	16.9	
14 20	21 40	3.07	2.94	2.79	2.63	2.43	2.31	2.16	2.09	2.02	1.94	1.85	1.75	16.4	
14 30	21 30	3.07	2.93	2.78	2.60	2.39	2.26	2.10	2.03	1.95	1.87	1.77	1.66	15.9	
14 40	21 20	3.07	2.92	2.76	2.58	2.35	2.21	2.05	1.97	1.89	1.80	1.70	1.59	15.4	
14 50	21 10	3.07	2.91	2.74	2.55	2.32	2.17	2.00	1.92	1.83	1.73	1.63	1.51	14.8	
15 00	21 00	3.07	2.91	2.73	2.53	2.28	2.13	1.95	1.86	1.77	1.67	1.56	1.44	14.2	
15 10	20 50	3.07	2.90	2.71	2.50	2.25	2.09	1.90	1.81	1.72	1.61	1.50	1.37	13.5	
15 20	20 40	3.07	2.89	2.70	2.48	2.21	2.05	1.85	1.76	1.66	1.56	1.44	1.30	12.9	
15 30	20 30	3.07	2.89	2.69	2.46	2.18	2.01	1.81	1.72	1.61	1.50	1.38	1.24	12.2	
15 40	20 20	3.07	2.88	2.67	2.44	2.15	1.98	1.77	1.67	1.57	1.45	1.32	1.18	11.5	
15 50	20 10	3.07	2.87	2.66	2.42	2.13	1.95	1.73	1.63	1.52	1.40	1.27	1.12	10.8	
16 00	20 00	3.07	2.87	2.65	2.40	2.10	1.92	1.69	1.59	1.48	1.36	1.22	1.07	10.0	
16 10	19 50	3.07	2.86	2.64	2.39	2.08	1.89	1.66	1.56	1.44	1.32	1.18	1.02	9.3	
16 20	19 40	3.07	2.86	2.63	2.37	2.06	1.86	1.63	1.52	1.41	1.28	1.14	0.98	8.5	
16 30	19 30	3.07	2.86	2.62	2.36	2.04	1.84	1.60	1.49	1.37	1.24	1.10	0.93	7.7	
16 40	19 20	3.07	2.85	2.62	2.35	2.02	1.82	1.58	1.47	1.34	1.21	1.06	0.90	6.9	
16 50	19 10	3.07	2.85	2.61	2.34	2.00	1.80	1.55	1.44	1.32	1.18	1.03	0.87	6.0	
17 00	19 00	3.07	2.85	2.60	2.33	1.99	1.78	1.53	1.42	1.30	1.16	1.01	0.84	5.2	
17 10	18 50	3.07	2.84	2.60	2.32	1.98	1.77	1.52	1.40	1.28	1.14	0.99	0.81	4.3	
17 20	18 40	3.07	2.84	2.59	2.31	1.97	1.76	1.50	1.39	1.26	1.12	0.97	0.79	3.5	
17 30	18 30	3.07	2.84	2.59	2.31	1.96	1.75	1.49	1.38	1.25	1.11	0.95	0.78	2.6	
17 40	18 20	3.07	2.84	2.59	2.30	1.96	1.74	1.49	1.37	1.24	1.10	0.94	0.77	1.8	
17 50	18 10	3.07	2.84	2.59	2.30	1.95	1.74	1.48	1.36	1.24	1.09	0.94	0.76	0.9	
18 00	18 00	3.07	2.84	2.59	2.30	1.95	1.74	1.48	1.36	1.23	1.09	0.93	0.76	0.0	

The above table is for northern declinations. For southern declinations use as argument $\alpha \pm 12^h$.

The table is based on the formulæ

$$p_\alpha = 3^s.0730 + 1^s.3362 \sin \alpha \tan \delta$$

$$p_\delta = 20^s.043 \cos \alpha$$

For more extended tables of precession in right ascension and declination the *Präcessions-Tafeln* of Richard Schorr, Director of the Hamburg Observatory in Bergedorf, may be consulted.

Sign of
 p_δ

h

0

+

6

-

18

+

24

TABLE XIII, 1935

REDUCTION OF STAR POSITIONS FROM THE MEAN EQUINOX
OF 1935.0 TO THE STANDARD EQUINOX OF 1950.0

α	$0^h, 12^h$		$1^h, 13^h$		$2^h, 14^h$	
	$+A_1-$	$+D-$	$+A_1-$	$+D-$	$+A_1-$	$+D-$
0	0.034 87	5 00.65	5.220 84	4 50.27	10.051 75	4 20.12 66
1	0.121 87	5 00.64	5.304 85	4 49.93 34	10.126 75	4 19.46 67
2	0.208 87	5 00.63	5.389 84	4 49.58 35	10.202 76	4 18.79 67
3	0.296 87	5 00.61	5.473 84	4 49.22 36	10.277 75	4 18.12 67
4	0.383 88	5 00.59	5.557 84	4 48.86 37	10.352 75	4 17.45 68
5	0.471 87	5 00.56	5.641 84	4 48.49 37	10.427 74	4 16.77 69
6	0.558 88	5 00.53	5.725 84	4 48.12 37	10.501 74	4 16.08 69
7	0.646 87	5 00.49	5.809 84	4 47.75 37	10.576 74	4 15.39 69
8	0.733 87	5 00.45	5.892 84	4 47.36 39	10.650 74	4 14.70 70
9	0.820 88	5 00.39	5.976 83	4 46.97 39	10.724 74	4 14.00 71
10	0.908 87	5 00.34	6.059 84	4 46.58 40	10.798 73	4 13.29 71
11	0.995 88	5 00.27	6.143 83	4 46.18 40	10.871 73	4 12.58 71
12	1.083 87	5 00.21	6.226 83	4 45.78 41	10.944 73	4 11.87 72
13	1.170 87	5 00.13	6.309 83	4 45.37 42	11.018 74	4 11.15 72
14	1.257 87	5 00.05	6.392 83	4 44.95 42	11.091 72	4 10.43 73
15	1.344 88	4 59.97	6.475 82	4 44.53 43	11.163 73	4 09.70 73
16	1.432 87	4 59.88	6.557 82	4 44.10 43	11.236 72	4 08.97 74
17	1.519 87	4 59.78	6.640 82	4 43.67 44	11.308 72	4 08.23 74
18	1.606 87	4 59.68	6.722 82	4 43.23 44	11.380 72	4 07.49 75
19	1.693 87	4 59.57	6.805 82	4 42.79 45	11.452 72	4 06.74 75
20	1.780 87	4 59.46	6.887 82	4 42.34 45	11.524 71	4 05.99 76
21	1.867 87	4 59.34	6.969 82	4 41.89 46	11.595 71	4 05.23 76
22	1.954 87	4 59.21	7.051 82	4 41.43 46	11.666 71	4 04.47 77
23	2.041 87	4 59.08	7.133 81	4 40.97 47	11.737 71	4 03.70 77
24	2.128 87	4 58.95	7.214 82	4 40.50 48	11.808 71	4 02.93 77
25	2.215 87	4 58.80	7.296 81	4 40.02 48	11.879 70	4 02.16 78
26	2.302 87	4 58.66	7.377 81	4 39.54 48	11.949 70	4 01.38 79
27	2.389 87	4 58.50	7.458 81	4 39.06 49	12.019 70	4 00.59 79
28	2.476 87	4 58.34	7.539 81	4 38.57 50	12.089 70	3 59.80 79
29	2.563 86	4 58.18	7.620 81	4 38.07 50	12.159 69	3 59.01 80
30	2.649 87	4 58.01	7.701 81	4 37.57 51	12.228 69	3 58.21 80
31	2.736 87	4 57.83	7.782 80	4 37.06 51	12.297 69	3 57.41 81
32	2.823 86	4 57.65	7.862 81	4 36.55 51	12.366 69	3 56.60 81
33	2.909 87	4 57.46	7.943 80	4 36.03 52	12.435 68	3 55.79 81
34	2.996 86	4 57.27	8.023 80	4 35.51 52	12.503 69	3 54.98 83
35	3.082 87	4 57.07	8.103 80	4 34.98 53	12.572 68	3 54.15 82
36	3.169 86	4 56.87	8.183 80	4 34.45 53	12.640 67	3 53.33 83
37	3.255 86	4 56.66	8.263 79	4 33.91 54	12.707 68	3 52.50 83
38	3.341 86	4 56.44	8.342 80	4 33.37 54	12.775 67	3 51.67 84
39	3.427 87	4 56.22	8.422 79	4 32.82 55	12.842 67	3 50.83 85
40	3.514 86	4 55.99	8.501 79	4 32.27 56	12.909 67	3 49.98 84
41	3.600 86	4 55.76	8.580 79	4 31.71 57	12.976 67	3 49.14 85
42	3.686 86	4 55.52	8.659 79	4 31.14 57	13.043 66	3 48.29 86
43	3.772 85	4 55.28	8.738 79	4 30.57 57	13.109 66	3 47.43 86
44	3.857 86	4 55.03	8.817 78	4 30.00 58	13.175 66	3 46.57 86
45	3.943 86	4 54.77	8.895 78	4 29.42 59	13.241 65	3 45.71 87
46	4.029 86	4 54.51	8.973 78	4 28.83 58	13.306 65	3 44.84 88
47	4.115 85	4 54.24	9.051 78	4 28.25 58	13.371 65	3 43.96 87
48	4.200 86	4 53.97	9.129 78	4 27.65 60	13.436 65	3 43.09 89
49	4.286 85	4 53.69	9.207 78	4 27.05 61	13.501 65	3 42.20 88
50	4.371 85	4 53.41	9.285 77	4 26.44 61	13.566 64	3 41.32 89
51	4.456 85	4 53.12	9.362 77	4 25.83 61	13.630 64	3 40.43 89
52	4.541 86	4 52.83	9.439 77	4 25.22 62	13.694 64	3 39.54 90
53	4.627 85	4 52.53	9.516 77	4 24.60 63	13.758 63	3 38.64 91
54	4.712 85	4 52.22	9.593 77	4 23.97 63	13.821 63	3 37.73 90
55	4.797 85	4 51.91	9.670 77	4 23.34 63	13.884 63	3 36.83 91
56	4.882 84	4 51.59	9.747 76	4 22.71 64	13.947 63	3 35.92 92
57	4.966 85	4 51.27	9.823 76	4 22.07 65	14.010 62	3 35.00 92
58	5.051 85	4 50.94	9.899 76	4 21.42 65	14.072 62	3 34.08 92
59	5.136 84	4 50.61	9.975 76	4 20.77 65	14.134 62	3 33.16 93
60	5.220	4 50.27	10.051	4 20.12	14.196	3 32.23

TABLE XIII, 1935

731

REDUCTION OF STAR POSITIONS FROM THE MEAN EQUINOX
OF 1935.0 TO THE STANDARD EQUINOX OF 1950.0

α	$3^h, 15^h$		$4^h, 16^h$		$5^h, 17^h$	
	$+A_1-$	$+D-$	$+A_1-$	$+D-$	$+A_1-$	$+D-$
0	14-196	3 32-23	17-375	2 29-89	19-369	1 17-33
1	14-258	3 31-30	17-418	2 28-75	19-391	1 16-06
2	14-319	3 30-37	17-461	2 27-61	19-413	1 14-79
3	14-380	3 29-43	17-504	2 26-46	19-435	1 13-52
4	14-441	3 28-48	17-546	2 25-32	19-456	1 12-24
5	14-502	3 27-54	17-588	2 24-17	19-477	1 10-97
6	14-562	3 26-58	17-630	2 23-01	19-497	1 09-69
7	14-622	3 25-63	17-672	2 21-86	19-517	1 08-42
8	14-682	3 24-67	17-713	2 20-70	19-537	1 07-14
9	14-741	3 23-71	17-754	2 19-54	19-556	1 05-86
10	14-800	3 22-74	17-794	2 18-38	19-575	1 04-58
11	14-859	3 21-77	17-834	2 17-21	19-594	1 03-30
12	14-917	3 20-80	17-874	2 16-04	19-612	1 02-01
13	14-976	3 19-82	17-913	2 14-87	19-630	1 00-73
14	15-034	3 18-84	17-952	2 13-70	19-647	0 59-45
15	15-091	3 17-85	17-991	2 12-52	19-664	0 58-16
16	15-149	3 16-86	18-029	2 11-34	19-681	0 56-87
17	15-206	3 15-87	18-067	2 10-16	19-698	0 55-58
18	15-263	3 14-87	18-105	2 08-98	19-714	0 54-29
19	15-319	3 13-87	18-142	2 07-79	19-729	0 53-00
20	15-375	3 12-87	18-179	2 06-60	19-744	0 51-71
21	15-431	3 11-86	18-216	2 05-41	19-759	0 50-42
22	15-487	3 10-85	18-252	2 04-22	19-774	0 49-12
23	15-543	3 09-83	18-288	2 03-02	19-788	0 47-83
24	15-598	3 08-81	18-324	2 01-83	19-802	0 46-53
25	15-652	3 07-79	18-359	2 00-62	19-815	0 45-24
26	15-707	3 06-76	18-394	1 59-42	19-828	0 43-94
27	15-761	3 05-73	18-429	1 58-22	19-841	0 42-64
28	15-815	3 04-70	18-463	1 57-01	19-853	0 41-34
29	15-869	3 03-66	18-497	1 55-80	19-865	0 40-04
30	15-922	3 02-62	18-530	1 54-59	19-876	0 38-74
31	15-975	3 01-58	18-563	1 53-37	19-887	0 37-44
32	16-027	3 00-53	18-596	1 52-16	19-898	0 36-14
33	16-080	2 59-48	18-629	1 50-94	19-908	0 34-84
34	16-132	2 58-43	18-661	1 49-72	19-918	0 33-53
35	16-184	2 57-37	18-693	1 48-50	19-928	0 32-23
36	16-235	2 56-31	18-724	1 47-27	19-937	0 30-92
37	16-286	2 55-24	18-755	1 46-04	19-946	0 29-62
38	16-337	2 54-18	18-786	1 44-82	19-954	0 28-31
39	16-387	2 53-10	18-816	1 43-59	19-962	0 27-01
40	16-438	2 52-03	18-846	1 42-35	19-970	0 25-70
41	16-488	2 50-95	18-876	1 41-12	19-977	0 24-39
42	16-537	2 49-87	18-905	1 39-88	19-984	0 23-09
43	16-586	2 48-79	18-934	1 38-64	19-990	0 21-78
44	16-635	2 47-70	18-962	1 37-40	19-997	0 20-47
45	16-684	2 46-61	18-990	1 36-16	20-002	0 19-16
46	16-732	2 45-52	19-018	1 34-92	20-008	0 17-85
47	16-780	2 44-42	19-045	1 33-67	20-013	0 16-54
48	16-828	2 43-32	19-072	1 32-42	20-017	0 15-23
49	16-875	2 42-22	19-099	1 31-18	20-022	0 13-92
50	16-922	2 41-11	19-125	1 29-93	20-026	0 12-61
51	16-969	2 40-00	19-151	1 28-67	20-029	0 11-30
52	17-015	2 38-89	19-177	1 27-42	20-032	0 09-99
53	17-061	2 37-78	19-202	1 26-16	20-035	0 08-68
54	17-107	2 36-66	19-227	1 24-90	20-037	0 07-37
55	17-153	2 35-54	19-252	1 23-64	20-039	0 06-06
56	17-198	2 34-41	19-276	1 22-38	20-041	0 04-74
57	17-242	2 33-29	19-300	1 21-12	20-042	0 03-43
58	17-287	2 32-16	19-323	1 19-86	20-043	0 02-12
59	17-331	2 31-02	19-346	1 18-59	20-043	0 00-81
60	17-375	2 29-89	19-369	1 17-33	20-043	

REDUCTION OF STAR POSITIONS FROM THE MEAN EQUINOX OF 1935-0 TO THE STANDARD EQUINOX OF 1950-0

α	$6^h, 18^h$		$7^h, 19^h$		$8^h, 20^h$	
	$+A_1-$	$-D+$	$+A_1-$	$-D+$	$+A_1-$	$-D+$
m	20-043	0 00-50	19-351	1 18-30	17-341	2 30-
0	20-043 0	0 01-82 132	19-328 23	1 19-57 127	17-297 44	2 31-
1	20-042 1	0 03-13 131	19-305 23	1 20-83 126	17-253 44	2 33-
2	20-041 1	0 04-44 131	19-281 24	1 22-09 127	17-208 45	2 34-
3	20-039 2	0 05-75 131	19-257 24	1 23-36 126	17-163 45	2 35-
4	20-038 3	0 07-06 131	19-233 25	1 24-62 125	17-118 46	2 36-
5	20-035 2	0 08-37 131	19-208 25	1 25-87 126	17-072 46	2 37-
6	20-033 3	0 09-68 132	19-183 25	1 27-13 125	17-026 46	2 38-
7	20-030 4	0 11-00 131	19-158 26	1 28-38 126	16-980 46	2 39-
8	20-026 4	0 12-31 131	19-132 27	1 29-64 125	16-933 47	2 40-
9	20-022 4	0 13-62 131	19-105 26	1 30-89 125	16-886 47	2 41-
10	20-018 4	0 14-93 131	19-079 27	1 32-14 125	16-839 47	2 43-
11	20-014 4	0 16-24 131	19-052 28	1 33-39 124	16-791 48	2 44-
12	20-009 5	0 17-55 131	19-024 27	1 34-63 125	16-743 48	2 45-
13	20-004 6	0 18-86 131	18-997 28	1 35-88 124	16-695 48	2 46-
14	19-998 6	0 20-17 131	18-969 29	1 37-12 124	16-647 49	2 47-
15	19-992 6	0 21-48 130	18-940 29	1 38-36 124	16-598 49	2 48-
16	19-986 7	0 22-78 131	18-911 29	1 39-60 123	16-549 49	2 49-
17	19-979 7	0 24-09 131	18-882 29	1 40-83 124	16-499 50	2 50-
18	19-972 8	0 25-40 131	18-853 30	1 42-07 123	16-449 50	2 51-
19	19-964 8	0 26-71 130	18-823 30	1 43-30 123	16-399 50	2 52-
20	19-956 8	0 28-01 131	18-793 31	1 44-53 123	16-349 51	2 53-
21	19-948 9	0 29-32 130	18-762 31	1 45-76 123	16-298 51	2 55-
22	19-939 9	0 30-62 131	18-731 31	1 46-99 122	16-247 51	2 56-
23	19-930 10	0 31-93 130	18-700 32	1 48-21 123	16-195 51	2 57-
24	19-920 10	0 33-23 130	18-668 32	1 49-44 122	16-144 52	2 58-
25	19-910 10	0 34-53 131	18-636 32	1 50-66 121	16-092 52	2 59-
26	19-900 10	0 35-84 130	18-604 33	1 51-87 122	16-040 52	3 00-
27	19-890 11	0 37-14 130	18-571 33	1 53-09 122	15-987 53	3 01-
28	19-879 12	0 38-44 130	18-538 33	1 54-31 121	15-934 53	3 02-
29	19-867 12	0 39-74 130	18-505 34	1 55-52 121	15-881 53	3 03-
30	19-855 12	0 41-04 130	18-471 34	1 56-73 121	15-827 54	3 04-
31	19-843 12	0 42-34 130	18-437 35	1 57-94 120	15-773 54	3 05-
32	19-831 13	0 43-64 130	18-402 35	1 59-14 121	15-719 54	3 06-
33	19-818 13	0 44-94 129	18-367 35	2 00-35 120	15-665 55	3 07-
34	19-805 14	0 46-23 130	18-332 35	2 01-55 119	15-610 55	3 08-
35	19-791 14	0 47-53 130	18-297 36	2 02-74 120	15-555 55	3 09-
36	19-777 14	0 48-82 130	18-261 36	2 03-94 119	15-500 55	3 10-
37	19-763 15	0 50-12 129	18-225 37	2 05-13 120	15-444 56	3 11-
38	19-748 15	0 51-41 129	18-188 37	2 06-33 119	15-388 56	3 12-
39	19-733 16	0 52-70 129	18-151 37	2 07-52 118	15-332 56	3 13-
40	19-717 16	0 53-99 129	18-114 38	2 08-70 119	15-276 57	3 14-
41	19-701 16	0 55-28 129	18-076 38	2 09-89 118	15-219 57	3 15-
42	19-685 17	0 56-57 129	18-038 38	2 11-07 118	15-162 57	3 16-
43	19-668 17	0 57-86 129	18-000 39	2 12-25 118	15-105 58	3 17-
44	19-651 17	0 59-15 128	17-961 39	2 13-43 117	15-047 58	3 18-
45	19-634 18	1 00-43 129	17-922 39	2 14-60 117	14-989 58	3 19-
46	19-616 18	1 01-72 128	17-883 40	2 15-77 117	14-931 59	3 20-
47	19-598 18	1 03-00 128	17-843 40	2 16-94 117	14-872 58	3 21-
48	19-580 19	1 04-28 128	17-803 40	2 18-11 116	14-814 59	3 22-
49	19-561 20	1 05-56 128	17-763 41	2 19-27 116	14-755 60	3 23-
50	19-541 20	1 06-84 128	17-722 41	2 20-43 116	14-695 59	3 24-
51	19-522 20	1 08-12 128	17-681 41	2 21-59 116	14-636 60	3 25-
52	19-502 21	1 09-40 127	17-640 42	2 22-75 115	14-576 60	3 26-
53	19-482 21	1 10-67 128	17-598 42	2 23-90 115	14-516 61	3 27-
54	19-461 21	1 11-95 127	17-556 42	2 25-05 115	14-455 61	3 28-
55	19-440 22	1 13-22 127	17-514 43	2 26-20 114	14-394 61	3 29-
56	19-418 22	1 14-49 127	17-471 43	2 27-34 115	14-333 61	3 30-
57	19-396 22	1 15-76 127	17-428 43	2 28-49 113	14-272 61	3 31-
58	19-374 23	1 17-03 127	17-385 43	2 29-62 114	14-211 62	3 32-
59	19-351 23	1 18-30 127	17-341 44	2 30-76 114	14-149 62	3 32-9

TABLE XIII, 1935

733

REDUCTION OF STAR POSITIONS FROM THE MEAN EQUINOX
OF 1935.0 TO THE STANDARD EQUINOX OF 1950.0

α	$9^h, 21^h$		$10^h, 22^h$		$11^h, 23^h$	
	$+A_1-$	$-D+$	$+A_1-$	$-D+$	$+A_1-$	$-D+$
0	14.149 62	3 32.95 92	9.993 76	4 20.62 65	5.155 85	4 50.53 34
1	14.087 63	3 33.87 92	9.917 76	4 21.27 65	5.070 85	4 50.87 34
2	14.024 63	3 34.79 92	9.841 76	4 21.92 65	4.986 84	4 51.20 33
3	13.962 63	3 35.71 91	9.764 76	4 22.56 64	4.901 85	4 51.52 32
4	13.899 63	3 36.62 91	9.688 77	4 23.20 63	4.816 85	4 51.84 31
5	13.836 64	3 37.53 90	9.611 77	4 23.83 62	4.731 85	4 52.15 31
6	13.772 63	3 38.43 90	9.534 77	4 24.45 63	4.646 85	4 52.46 30
7	13.709 64	3 39.33 89	9.457 77	4 25.08 61	4.561 85	4 52.76 30
8	13.645 64	3 40.22 89	9.380 77	4 25.69 61	4.476 85	4 53.06 28
9	13.581 65	3 41.11 89	9.303 78	4 26.30 61	4.391 86	4 53.34 29
10	13.516 65	3 42.00 88	9.225 78	4 26.91 60	4.305 85	4 53.63 28
11	13.451 65	3 42.88 88	9.147 78	4 27.51 60	4.220 86	4 53.91 27
12	13.386 65	3 43.76 87	9.069 78	4 28.11 59	4.134 85	4 54.18 27
13	13.321 65	3 44.63 87	8.991 78	4 28.70 58	4.049 86	4 54.45 26
14	13.256 66	3 45.50 87	8.913 78	4 29.28 59	3.963 86	4 54.71 26
15	13.190 66	3 46.37 86	8.835 79	4 29.87 57	3.877 86	4 54.97 25
16	13.124 66	3 47.23 86	8.756 79	4 30.44 57	3.791 86	4 55.22 24
17	13.058 66	3 48.09 85	8.677 79	4 31.01 57	3.705 86	4 55.46 24
18	12.992 67	3 48.94 85	8.598 79	4 31.58 56	3.619 86	4 55.70 24
19	12.925 67	3 49.79 84	8.519 79	4 32.14 55	3.533 86	4 55.94 23
20	12.858 67	3 50.63 84	8.440 79	4 32.69 55	3.447 86	4 56.17 22
21	12.791 68	3 51.47 84	8.361 80	4 33.24 55	3.361 86	4 56.39 22
22	12.723 68	3 52.31 83	8.281 79	4 33.79 53	3.275 86	4 56.61 21
23	12.655 68	3 53.14 82	8.202 80	4 34.32 54	3.189 87	4 56.82 20
24	12.587 68	3 53.96 83	8.122 80	4 34.86 53	3.102 86	4 57.02 20
25	12.519 68	3 54.79 81	8.042 81	4 35.39 52	3.016 87	4 57.22 20
26	12.451 69	3 55.60 81	7.961 80	4 35.91 52	2.929 86	4 57.42 19
27	12.382 69	3 56.41 81	7.881 80	4 36.43 51	2.843 87	4 57.61 18
28	12.313 69	3 57.22 81	7.801 81	4 36.94 51	2.756 86	4 57.79 18
29	12.244 69	3 58.03 80	7.720 81	4 37.45 50	2.670 87	4 57.97 17
30	12.175 70	3 58.83 79	7.639 81	4 37.95 50	2.583 87	4 58.14 17
31	12.105 70	3 59.62 79	7.558 81	4 38.45 49	2.496 87	4 58.31 16
32	12.035 70	4 00.41 79	7.477 81	4 38.94 49	2.409 87	4 58.47 15
33	11.965 70	4 01.20 78	7.396 81	4 39.43 48	2.322 86	4 58.62 15
34	11.895 70	4 01.98 77	7.315 82	4 39.91 48	2.236 87	4 58.77 14
35	11.825 71	4 02.75 78	7.233 82	4 40.39 47	2.149 87	4 58.91 14
36	11.754 71	4 03.53 76	7.151 81	4 40.86 47	2.062 87	4 59.05 13
37	11.683 71	4 04.29 76	7.070 82	4 41.33 45	1.975 87	4 59.18 13
38	11.612 71	4 05.05 76	6.988 82	4 41.78 45	1.888 87	4 59.31 12
39	11.540 71	4 05.81 75	6.906 82	4 42.24 45	1.801 88	4 59.43 12
40	11.469 72	4 06.56 75	6.824 83	4 42.69 44	1.713 87	4 59.55 11
41	11.397 72	4 07.31 75	6.741 82	4 43.13 44	1.626 87	4 59.66 10
42	11.325 72	4 08.06 73	6.659 83	4 43.57 44	1.539 87	4 59.76 10
43	11.253 73	4 08.79 74	6.576 82	4 44.00 43	1.452 87	4 59.86 9
44	11.180 73	4 09.53 73	6.494 83	4 44.43 42	1.365 88	4 59.95 9
45	11.107 73	4 10.26 72	6.411 83	4 44.85 42	1.277 87	5 00.04 8
46	11.034 73	4 10.98 72	6.328 83	4 45.27 41	1.190 87	5 00.12 7
47	10.961 73	4 11.70 72	6.245 83	4 45.68 41	1.103 88	5 00.19 7
48	10.888 73	4 12.42 71	6.162 84	4 46.09 40	1.015 87	5 00.26 6
49	10.815 74	4 13.13 70	6.078 83	4 46.49 39	0.928 87	5 00.32 6
50	10.741 74	4 13.83 70	5.995 83	4 46.88 39	0.841 88	5 00.38 6
51	10.667 74	4 14.53 70	5.912 84	4 47.27 39	0.753 87	5 00.44 4
52	10.593 74	4 15.23 69	5.828 84	4 47.66 38	0.666 87	5 00.48 4
53	10.519 75	4 15.92 69	5.744 84	4 48.04 37	0.579 88	5 00.52 4
54	10.444 75	4 16.61 68	5.660 84	4 48.41 37	0.491 87	5 00.56 3
55	10.369 75	4 17.29 67	5.576 84	4 48.78 36	0.404 88	5 00.59 2
56	10.294 75	4 17.96 67	5.492 84	4 49.14 36	0.316 87	5 00.61 2
57	10.219 75	4 18.63 67	5.408 84	4 49.50 35	0.229 88	5 00.63 1
58	10.144 76	4 19.30 66	5.324 84	4 49.85 34	0.141 87	5 00.64 1
59	10.068 75	4 19.96 66	5.240 85	4 50.19 34	0.054 88	5 00.65 0
60	9.993	4 20.62	5.155	4 50.53		

TABLE XIV, 1935

REDUCTION OF STAR POSITIONS FROM THE MEAN EQUINOX
OF 1935.0 TO THE STANDARD EQUINOX OF 1950.0

α	A	A_1	D_1	α	α	A	A_1	D_1	α
^h ^m	^s	^s	^s	^h ^m	^h ^m	^s	^s	^s	^h ^m
0 00	+46.097	+0.000	-0.00	12 00	6 00	+46.097	-0.000	-0.22	18 00
10	.098	.001	.00	10	10	.096	.001	.22	10
20	.098	.003	.00	20	20	.096	.003	.22	20
30	.099	.004	.00	30	30	.095	.004	.22	30
40	.099	.005	.01	40	40	.094	.005	.21	40
50	.100	.006	.01	50	50	.094	.006	.21	50
1 00	+46.101	+0.007	-0.01	13 00	7 00	+46.093	-0.007	-0.20	19 00
10	.101	.008	.02	10	10	.093	.008	.20	10
20	.102	.009	.03	20	20	.092	.009	.19	20
30	.102	.010	.03	30	30	.092	.010	.19	30
40	.103	.011	.04	40	40	.091	.011	.18	40
50	.103	.012	.05	50	50	.091	.012	.17	50
2 00	+46.103	+0.013	-0.06	14 00	8 00	+46.091	-0.013	-0.16	20 00
10	.104	.013	.06	10	10	.090	.013	.16	10
20	.104	.014	.07	20	20	.090	.014	.15	20
30	.104	.014	.08	30	30	.090	.014	.14	30
40	.104	.014	.09	40	40	.090	.014	.13	40
50	.104	.015	.10	50	50	.090	.015	.12	50
3 00	+46.104	+0.015	-0.11	15 00	9 00	+46.090	-0.015	-0.11	21 00
10	.104	.015	.12	10	10	.090	.015	.10	10
20	.104	.014	.13	20	20	.090	.014	.09	20
30	.104	.014	.14	30	30	.090	.014	.08	30
40	.104	.014	.15	40	40	.090	.014	.07	40
50	.104	.013	.16	50	50	.090	.013	.06	50
4 00	+46.103	+0.013	-0.16	16 00	10 00	+46.091	-0.013	-0.05	22 00
10	.103	.012	.17	10	10	.091	.012	.05	10
20	.103	.011	.18	20	20	.091	.011	.04	20
30	.102	.010	.19	30	30	.092	.010	.03	30
40	.102	.009	.19	40	40	.092	.009	.03	40
50	.101	.008	.20	50	50	.093	.008	.02	50
5 00	+46.101	+0.007	-0.20	17 00	11 00	+46.093	-0.007	-0.01	23 00
10	.100	.006	.21	10	10	.094	.006	.01	10
20	.099	.005	.21	20	20	.094	.005	.01	20
30	.099	.004	.22	30	30	.095	.004	.00	30
40	.098	.002	.22	40	40	.096	.002	.00	40
50	.098	.001	.22	50	50	.096	.001	.00	50
6 00	+46.097	+0.000	-0.22	18 00	12 00	+46.097	-0.000	-0.00	24 00

$$\alpha_{1950} = \alpha_{1935} + A + A_1 \tan \delta_{1935} + A_2 \tan^2 \delta_{1935}$$

$$\delta_{1950} = \delta_{1935} + D + D_1 \tan \delta_{1935}$$

A_1 and D are taken from Table XIII with argument α_{1935} . For values of the argument between 0^h and 12^h the sign on the left is to be taken, and for values between 12^h and 24^h the sign on the right.

Using accents to denote quantities taken from these tables with argument $24^h - \alpha_{1950}$

$$\alpha_{1935} = \alpha_{1950} - A' + A'_1 \tan \delta_{1950} - A'_2 \tan^2 \delta_{1950}$$

$$\delta_{1935} = \delta_{1950} - D' + D'_1 \tan \delta_{1950}$$

TABLE XV, 1935

735

FOR REDUCTION FROM THE STANDARD EQUINOX OF 1950-0
TO THE TRUE EQUINOX OF DATE

δ	$4 \tan \delta$	Date	f	g	G	Date	f	g	G
0	0.00	Jan. -2*	-45.2	4.92	$\begin{smallmatrix} h & m \\ 12 & 03 \end{smallmatrix}$	July 1	-43.6	4.74	$\begin{smallmatrix} h & m \\ 12 & 02 \end{smallmatrix}$
1	0.07	6	45.1	4.91	03	9	43.5	4.73	02
2	0.14	14	45.0	4.90	03	17*	43.4	4.72	02
3	0.21	22	45.0	4.89	03	25	43.3	4.71	02
4	0.28	30	44.9	4.88	03	Aug. 2	43.3	4.70	02
5	0.35	Feb. 7*	-44.8	4.87	$\begin{smallmatrix} 12 & 03 \end{smallmatrix}$	10	-43.2	4.70	$\begin{smallmatrix} 12 & 02 \end{smallmatrix}$
6	0.42	15	44.7	4.87	03	18	43.1	4.69	02
7	0.49	23	44.7	4.86	03	26*	43.1	4.68	02
8	0.56	Mar. 3	44.6	4.85	03	Sept. 3	43.0	4.68	02
9	0.63	11	44.6	4.85	03	11	43.0	4.67	02
10	0.71	19*	-44.5	4.84	$\begin{smallmatrix} 12 & 04 \end{smallmatrix}$	19	-42.9	4.67	$\begin{smallmatrix} 12 & 02 \end{smallmatrix}$
11	0.78	27	44.5	4.83	03	27	42.9	4.66	02
12	0.85	Apr. 4	44.4	4.83	03	Oct. 5*	42.8	4.65	02
13	0.92	12	44.4	4.82	03	13	42.8	4.65	02
14	1.00	20	44.3	4.82	03	21	42.7	4.64	02
15	1.07	28*	-44.2	4.81	$\begin{smallmatrix} 12 & 03 \end{smallmatrix}$	29	-42.6	4.63	$\begin{smallmatrix} 12 & 02 \end{smallmatrix}$
16	1.15	May 6	44.2	4.80	03	Nov. 6	42.6	4.63	02
17	1.22	14	44.1	4.79	03	14*	42.5	4.62	02
18	1.30	22	44.0	4.79	03	22	42.4	4.61	01
19	1.38	30	43.9	4.78	02	30	42.3	4.60	01
20	1.46	June 7*	-43.9	4.77	$\begin{smallmatrix} 12 & 02 \end{smallmatrix}$	Dec. 8	-42.3	4.59	$\begin{smallmatrix} 12 & 01 \end{smallmatrix}$
21	1.54	15	43.8	4.76	02	16	42.2	4.58	01
22	1.62	23	43.7	4.75	02	24*	42.1	4.58	01
23	1.70	July 1	-43.6	4.74	$\begin{smallmatrix} 12 & 02 \end{smallmatrix}$	32	-42.0	4.57	$\begin{smallmatrix} 12 & 01 \end{smallmatrix}$
24	1.78	$4 \tan \delta$							
25	1.87	δ	$0'$	$10'$	$20'$	$30'$	$40'$	$50'$	$60'$
26	1.95	0							
27	2.04	47	4.29	4.32	4.34	4.36	4.39	4.42	4.44
28	2.13	48	4.44	4.47	4.49	4.52	4.55	4.57	4.60
29	2.22	49	4.60	4.63	4.66	4.68	4.71	4.74	4.77
30	2.31	50	4.77	4.80	4.82	4.85	4.88	4.91	4.94
31	2.40	51	4.94	4.97	5.00	5.03	5.06	5.09	5.12
32	2.50	52	5.12	5.15	5.18	5.21	5.24	5.28	5.31
33	2.60	53	5.31	5.34	5.37	5.41	5.44	5.47	5.51
34	2.70	54	5.51	5.54	5.57	5.61	5.64	5.68	5.71
35	2.80	55	5.71	5.75	5.78	5.82	5.86	5.89	5.93
36	2.91	56	5.93	5.97	6.01	6.04	6.08	6.12	6.16
37	3.02	57	6.16	6.20	6.24	6.28	6.32	6.36	6.40
38	3.13	58	6.40	6.44	6.48	6.53	6.57	6.61	6.66
39	3.24	59	6.66	6.70	6.75	6.79	6.84	6.88	6.93
40	3.36	60	6.93	6.98	7.02	7.07	7.12	7.17	7.22
41	3.48	61	7.22	7.27	7.32	7.37	7.42	7.47	7.52
42	3.60	62	7.52	7.58	7.63	7.68	7.74	7.79	7.85
43	3.73	63	7.85	7.91	7.97	8.02	8.08	8.14	8.20
44	3.86	64	8.20	8.26	8.32	8.39	8.45	8.51	8.58
45	4.00	$a_{\text{Date}} = a_{1950} + f + 4g \sin (G + a_{1950}) \tan \delta_{1950}$							
46	4.14	$\delta_{\text{Date}} = \delta_{1950} + g \cos (G + a_{1950})$							
47	4.29	Natural sines and cosines are given on page 295.							

TABLE XVI, 1935

AZIMUTH OF POLARIS

For hour angles 0^h to 12^h *Polaris* is west of north, and for hour angles 12^h to 24^h it is east of north.

Lat. H.A.	10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. H.A.
0 00	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	24 00
0 10	0 02.8	0 02.8	0 02.9	0 03.0	0 03.0	0 03.0	0 03.1	0 03.2	0 03.3	23 50
0 20	0 05.5	0 05.7	0 05.8	0 05.9	0 06.0	0 06.1	0 06.2	0 06.3	0 06.5	23 40
0 30	0 08.3	0 08.5	0 08.7	0 08.9	0 09.0	0 09.2	0 09.3	0 09.5	0 09.7	23 30
0 40	0 11.0	0 11.3	0 11.6	0 11.8	0 12.0	0 12.2	0 12.4	0 12.7	0 12.9	23 20
0 50	0 13.8	0 14.1	0 14.5	0 14.7	0 14.9	0 15.2	0 15.5	0 15.8	0 16.1	23 10
1 00	0 16.5	0 16.8	0 17.3	0 17.5	0 17.8	0 18.2	0 18.5	0 18.8	0 19.3	23 00
1 10	0 19.1	0 19.5	0 20.1	0 20.4	0 20.7	0 21.1	0 21.5	0 21.9	0 22.4	22 50
1 20	0 21.7	0 22.2	0 22.9	0 23.2	0 23.6	0 24.0	0 24.4	0 24.9	0 25.4	22 40
1 30	0 24.3	0 24.8	0 25.6	0 25.9	0 26.4	0 26.8	0 27.3	0 27.9	0 28.5	22 30
1 40	0 26.9	0 27.4	0 28.2	0 28.6	0 29.1	0 29.6	0 30.2	0 30.8	0 31.4	22 20
1 50	0 29.4	0 30.0	0 30.9	0 31.3	0 31.8	0 32.3	0 32.9	0 33.6	0 34.3	22 10
2 00	0 31.8	0 32.5	0 33.4	0 33.9	0 34.4	0 35.0	0 35.6	0 36.4	0 37.2	22 00
2 10	0 34.2	0 34.9	0 35.9	0 36.4	0 37.0	0 37.6	0 38.3	0 39.1	0 39.9	21 50
2 20	0 36.5	0 37.2	0 38.3	0 38.8	0 39.5	0 40.1	0 40.9	0 41.7	0 42.6	21 40
2 30	0 38.7	0 39.5	0 40.6	0 41.2	0 41.9	0 42.6	0 43.4	0 44.2	0 45.2	21 30
2 40	0 40.8	0 41.7	0 42.9	0 43.5	0 44.2	0 45.0	0 45.8	0 46.7	0 47.7	21 20
2 50	0 42.9	0 43.8	0 45.1	0 45.7	0 46.4	0 47.2	0 48.1	0 49.1	0 50.1	21 10
3 00	0 44.9	0 45.9	0 47.2	0 47.8	0 48.6	0 49.4	0 50.3	0 51.3	0 52.5	21 00
3 10	0 46.8	0 47.8	0 49.2	0 49.9	0 50.7	0 51.5	0 52.4	0 53.5	0 54.7	20 50
3 20	0 48.7	0 49.7	0 51.1	0 51.8	0 52.6	0 53.5	0 54.5	0 55.6	0 56.8	20 40
3 30	0 50.4	0 51.4	0 52.9	0 53.6	0 54.5	0 55.4	0 56.4	0 57.5	0 58.8	20 30
3 40	0 52.0	0 53.1	0 54.6	0 55.4	0 56.2	0 57.2	0 58.2	0 59.4	1 00.7	20 20
3 50	0 53.5	0 54.6	0 56.2	0 57.0	0 57.9	0 58.8	0 59.9	1 01.1	1 02.5	20 10
4 00	0 55.0	0 56.1	0 57.7	0 58.5	0 59.4	1 00.4	1 01.5	1 02.7	1 04.1	20 00
4 10	0 56.3	0 57.5	0 59.1	0 59.9	1 00.8	1 01.9	1 03.0	1 04.2	1 05.6	19 50
4 20	0 57.5	0 58.7	1 00.4	1 01.2	1 02.1	1 03.2	1 04.3	1 05.6	1 07.0	19 40
4 30	0 58.6	0 59.8	1 01.5	1 02.4	1 03.3	1 04.4	1 05.5	1 06.9	1 08.3	19 30
4 40	0 59.6	1 00.8	1 02.5	1 03.4	1 04.4	1 05.5	1 06.6	1 08.0	1 09.4	19 20
4 50	1 00.5	1 01.7	1 03.5	1 04.3	1 05.3	1 06.4	1 07.6	1 09.0	1 10.4	19 10
5 00	1 01.3	1 02.5	1 04.3	1 05.2	1 06.1	1 07.2	1 08.5	1 09.8	1 11.3	19 00
5 10	1 01.9	1 03.2	1 04.9	1 05.8	1 06.8	1 07.9	1 09.2	1 10.5	1 12.0	18 50
5 20	1 02.4	1 03.7	1 05.5	1 06.4	1 07.4	1 08.5	1 09.7	1 11.1	1 12.6	18 40
5 30	1 02.9	1 04.1	1 05.9	1 06.8	1 07.8	1 08.9	1 10.2	1 11.6	1 13.1	18 30
5 40	1 03.2	1 04.4	1 06.2	1 07.1	1 08.1	1 09.2	1 10.5	1 11.9	1 13.4	18 20
5 50	1 03.3	1 04.6	1 06.4	1 07.3	1 08.3	1 09.4	1 10.6	1 12.0	1 13.6	18 10
6 00	1 03.4	1 04.6	1 06.4	1 07.3	1 08.3	1 09.5	1 10.7	1 12.1	1 13.6	18 00
6 10	1 03.3	1 04.5	1 06.3	1 07.2	1 08.2	1 09.4	1 10.6	1 12.0	1 13.5	17 50
6 20	1 03.1	1 04.3	1 06.1	1 07.0	1 08.0	1 09.1	1 10.4	1 11.7	1 13.3	17 40
6 30	1 02.8	1 04.0	1 05.8	1 06.7	1 07.7	1 08.8	1 10.0	1 11.4	1 12.9	17 30
6 40	1 02.4	1 03.6	1 05.3	1 06.2	1 07.2	1 08.3	1 09.5	1 10.9	1 12.3	17 20
6 50	1 01.8	1 03.0	1 04.8	1 05.6	1 06.6	1 07.7	1 08.9	1 10.2	1 11.7	17 10
7 00	1 01.2	1 02.3	1 04.1	1 04.9	1 05.9	1 06.9	1 08.1	1 09.4	1 10.9	17 00
7 10	1 00.4	1 01.5	1 03.2	1 04.1	1 05.0	1 06.1	1 07.2	1 08.5	1 10.0	16 50
7 20	0 59.5	1 00.6	1 02.3	1 03.1	1 04.0	1 05.1	1 06.2	1 07.5	1 08.9	16 40
7 30	0 58.5	0 59.6	1 01.2	1 02.0	1 02.9	1 03.9	1 05.1	1 06.3	1 07.7	16 30
7 40	0 57.4	0 58.4	1 00.0	1 00.8	1 01.7	1 02.7	1 03.8	1 05.0	1 06.4	16 20
7 50	0 56.1	0 57.2	0 58.7	0 59.5	1 00.4	1 01.3	1 02.4	1 03.6	1 05.0	16 10
8 00	0 54.8	0 55.8	0 57.3	0 58.1	0 58.9	0 59.9	1 00.9	1 02.1	1 03.4	16 00
8 10	0 53.4	0 54.4	0 55.8	0 56.5	0 57.4	0 58.3	0 59.3	1 00.4	1 01.7	15 50
8 20	0 51.8	0 52.8	0 54.2	0 54.9	0 55.7	0 56.6	0 57.6	0 58.7	0 59.9	15 40
8 30	0 50.2	0 51.1	0 52.5	0 53.2	0 54.0	0 54.8	0 55.8	0 56.8	0 58.0	15 30
8 40	0 48.5	0 49.3	0 50.7	0 51.3	0 52.1	0 52.9	0 53.8	0 54.8	0 56.0	15 20
8 50	0 46.6	0 47.5	0 48.8	0 49.4	0 50.1	0 50.9	0 51.8	0 52.8	0 53.9	15 10
9 00	0 44.7	0 45.5	0 46.8	0 47.4	0 48.0	0 48.8	0 49.7	0 50.6	0 51.6	15 00

TABLE XVI, 1935

737

AZIMUTH OF POLARIS

For hour angles 0^h to 12^h *Polaris* is west of north, and for hour angles 12^h to 24^h it is east of north.

Lat. H.A.	10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. H.A.
^h ^m										^h ^m
9 00	0 44.7	0 45.5	0 46.8	0 47.4	0 48.0	0 48.8	0 49.7	0 50.6	0 51.6	15 00
9 10	0 42.7	0 43.5	0 44.7	0 45.2	0 45.9	0 46.6	0 47.4	0 48.3	0 49.3	14 50
9 20	0 40.6	0 41.4	0 42.5	0 43.0	0 43.7	0 44.4	0 45.1	0 46.0	0 46.9	14 40
9 30	0 38.5	0 39.2	0 40.2	0 40.8	0 41.3	0 42.0	0 42.7	0 43.5	0 44.4	14 30
9 40	0 36.3	0 36.9	0 37.9	0 38.4	0 38.9	0 39.6	0 40.2	0 41.0	0 41.8	14 20
9 50	0 34.0	0 34.6	0 35.5	0 35.9	0 36.5	0 37.0	0 37.7	0 38.4	0 39.2	14 10
10 00	0 31.6	0 32.2	0 33.0	0 33.4	0 33.9	0 34.5	0 35.1	0 35.7	0 36.4	14 00
10 10	0 29.2	0 29.7	0 30.5	0 30.9	0 31.3	0 31.8	0 32.4	0 33.0	0 33.6	13 50
10 20	0 26.7	0 27.2	0 27.9	0 28.3	0 28.7	0 29.1	0 29.6	0 30.2	0 30.8	13 40
10 30	0 24.2	0 24.6	0 25.3	0 25.6	0 25.9	0 26.4	0 26.8	0 27.3	0 27.9	13 30
10 40	0 21.6	0 22.0	0 22.6	0 22.9	0 23.2	0 23.6	0 24.0	0 24.4	0 24.9	13 20
10 50	0 19.0	0 19.3	0 19.9	0 20.1	0 20.4	0 20.7	0 21.1	0 21.5	0 21.9	13 10
11 00	0 16.4	0 16.6	0 17.1	0 17.3	0 17.6	0 17.8	0 18.1	0 18.5	0 18.8	13 00
11 10	0 13.7	0 13.9	0 14.3	0 14.5	0 14.7	0 14.9	0 15.2	0 15.5	0 15.8	12 50
11 20	0 11.0	0 11.2	0 11.5	0 11.6	0 11.8	0 12.0	0 12.2	0 12.4	0 12.7	12 40
11 30	0 08.2	0 08.4	0 08.6	0 08.7	0 08.8	0 09.0	0 09.1	0 09.3	0 09.5	12 30
11 40	0 05.5	0 05.6	0 05.8	0 05.8	0 05.9	0 06.0	0 06.1	0 06.2	0 06.3	12 20
11 50	0 02.8	0 02.8	0 02.9	0 02.9	0 03.0	0 03.0	0 03.0	0 03.1	0 03.2	12 10
12 00	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	12 00

Lat. H.A.	32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. H.A.
^h ^m										^h ^m
0 00	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	24 00
0 10	0 03.3	0 03.3	0 03.4	0 03.5	0 03.6	0 03.7	0 03.8	0 04.0	0 04.2	23 50
0 20	0 06.5	0 06.6	0 06.8	0 07.0	0 07.2	0 07.4	0 07.7	0 08.0	0 08.3	23 40
0 30	0 09.7	0 09.9	0 10.2	0 10.5	0 10.8	0 11.2	0 11.5	0 12.0	0 12.4	23 30
0 40	0 12.9	0 13.2	0 13.6	0 14.0	0 14.4	0 14.8	0 15.3	0 15.9	0 16.5	23 20
0 50	0 16.1	0 16.5	0 16.9	0 17.4	0 17.9	0 18.5	0 19.1	0 19.8	0 20.6	23 10
1 00	0 19.3	0 19.7	0 20.2	0 20.8	0 21.4	0 22.1	0 22.8	0 23.7	0 24.6	23 00
1 10	0 22.4	0 22.9	0 23.5	0 24.1	0 24.9	0 25.7	0 26.5	0 27.5	0 28.6	22 50
1 20	0 25.4	0 26.0	0 26.7	0 27.4	0 28.3	0 29.2	0 30.2	0 31.3	0 32.5	22 40
1 30	0 28.5	0 29.1	0 29.9	0 30.7	0 31.6	0 32.6	0 33.8	0 35.0	0 36.4	22 30
1 40	0 31.4	0 32.2	0 33.0	0 33.9	0 34.9	0 36.0	0 37.3	0 38.6	0 40.2	22 20
1 50	0 34.3	0 35.1	0 36.0	0 37.0	0 38.2	0 39.3	0 40.7	0 42.2	0 43.9	22 10
2 00	0 37.2	0 38.0	0 39.0	0 40.1	0 41.3	0 42.6	0 44.1	0 45.7	0 47.5	22 00
2 10	0 39.9	0 40.9	0 41.9	0 43.1	0 44.3	0 45.8	0 47.3	0 49.1	0 51.0	21 50
2 20	0 42.6	0 43.6	0 44.7	0 46.0	0 47.3	0 48.8	0 50.5	0 52.3	0 54.4	21 40
2 30	0 45.2	0 46.3	0 47.5	0 48.8	0 50.2	0 51.8	0 53.6	0 55.5	0 57.7	21 30
2 40	0 47.7	0 48.9	0 50.1	0 51.5	0 53.0	0 54.7	0 56.5	0 58.6	1 00.9	21 20
2 50	0 50.1	0 51.3	0 52.6	0 54.1	0 55.7	0 57.4	0 59.4	1 01.6	1 04.0	21 10
3 00	0 52.5	0 53.7	0 55.1	0 56.6	0 58.2	1 00.1	1 02.1	1 04.4	1 06.9	21 00
3 10	0 54.7	0 56.0	0 57.4	0 59.0	1 00.7	1 02.6	1 04.7	1 07.1	1 09.7	20 50
3 20	0 56.8	0 58.1	0 59.6	1 01.3	1 03.0	1 05.0	1 07.2	1 09.7	1 12.4	20 40
3 30	0 58.8	1 00.2	1 01.7	1 03.4	1 05.2	1 07.3	1 09.6	1 12.1	1 14.9	20 30
3 40	1 00.7	1 02.1	1 03.7	1 05.4	1 07.3	1 09.5	1 11.8	1 14.4	1 17.3	20 20
3 50	1 02.5	1 03.9	1 05.5	1 07.3	1 09.3	1 11.5	1 13.9	1 16.5	1 19.5	20 10
4 00	1 04.1	1 05.6	1 07.3	1 09.1	1 11.1	1 13.3	1 15.8	1 18.5	1 21.6	20 00
4 10	1 05.6	1 07.2	1 08.9	1 10.7	1 12.8	1 15.0	1 17.6	1 20.4	1 23.5	19 50
4 20	1 07.0	1 08.6	1 10.3	1 12.2	1 14.3	1 16.6	1 19.2	1 22.1	1 25.2	19 40
4 30	1 08.3	1 09.9	1 11.6	1 13.6	1 15.7	1 18.1	1 20.7	1 23.6	1 26.8	19 30
4 40	1 09.4	1 11.0	1 12.8	1 14.8	1 17.0	1 19.4	1 22.0	1 25.0	1 28.2	19 20
4 50	1 10.4	1 12.1	1 13.9	1 15.9	1 18.1	1 20.5	1 23.2	1 26.2	1 29.5	19 10
5 00	1 11.3	1 13.0	1 14.8	1 16.8	1 19.0	1 21.5	1 24.2	1 27.2	1 30.6	19 00

TABLE XVI, 1935

AZIMUTH OF POLARIS

For hour angles 0^h to 12^h *Polaris* is west of north, and for hour angles 12^h to 24^h it is east of north.

Lat. H.A.	32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. H.A.
h m	°	°	°	°	°	°	°	°	°	h m
5 00	I 11.3	I 13.0	I 14.8	I 16.8	I 19.0	I 21.5	I 24.2	I 27.2	I 30.6	19 00
5 10	I 12.0	I 13.7	I 15.5	I 17.6	I 19.8	I 22.3	I 25.0	I 28.1	I 31.5	18 50
5 20	I 12.6	I 14.3	I 16.1	I 18.2	I 20.5	I 22.9	I 25.7	I 28.8	I 32.2	18 40
5 30	I 13.1	I 14.8	I 16.6	I 18.7	I 20.9	I 23.4	I 26.2	I 29.3	I 32.7	18 30
5 40	I 13.4	I 15.1	I 16.9	I 19.0	I 21.3	I 23.8	I 26.6	I 29.6	I 33.1	18 20
5 50	I 13.6	I 15.3	I 17.1	I 19.2	I 21.5	I 24.0	I 26.8	I 29.8	I 33.3	18 10
6 00	I 13.6	I 15.3	I 17.1	I 19.2	I 21.5	I 24.0	I 26.8	I 29.8	I 33.3	18 00
6 10	I 13.5	I 15.2	I 17.0	I 19.1	I 21.3	I 23.8	I 26.6	I 29.7	I 33.1	17 50
6 20	I 13.3	I 14.9	I 16.8	I 18.8	I 21.0	I 23.5	I 26.3	I 29.4	I 32.8	17 40
6 30	I 12.9	I 14.5	I 16.4	I 18.4	I 20.6	I 23.1	I 25.8	I 28.9	I 32.2	17 30
6 40	I 12.3	I 14.0	I 15.8	I 17.8	I 20.0	I 22.5	I 25.2	I 28.2	I 31.5	17 20
6 50	I 11.7	I 13.3	I 15.1	I 17.1	I 19.3	I 21.7	I 24.4	I 27.4	I 30.7	17 10
7 00	I 10.9	I 12.5	I 14.3	I 16.2	I 18.4	I 20.8	I 23.4	I 26.4	I 29.6	17 00
7 10	I 10.0	I 11.5	I 13.3	I 15.2	I 17.3	I 19.7	I 22.3	I 25.2	I 28.4	16 50
7 20	I 08.9	I 10.5	I 12.2	I 14.1	I 16.1	I 18.5	I 21.0	I 23.9	I 27.1	16 40
7 30	I 07.7	I 09.2	I 10.9	I 12.8	I 14.8	I 17.1	I 19.6	I 22.4	I 25.5	16 30
7 40	I 06.4	I 07.9	I 09.5	I 11.4	I 13.4	I 15.6	I 18.1	I 20.8	I 23.8	16 20
7 50	I 05.0	I 06.4	I 08.0	I 09.8	I 11.8	I 13.9	I 16.3	I 19.0	I 22.0	16 10
8 00	I 03.4	I 04.8	I 06.4	I 08.1	I 10.0	I 12.1	I 14.5	I 17.1	I 20.0	16 00
8 10	I 01.7	I 03.1	I 04.6	I 06.3	I 08.2	I 10.2	I 12.5	I 15.0	I 17.8	15 50
8 20	0 59.9	I 01.3	I 02.7	I 04.3	I 06.2	I 08.2	I 10.3	I 12.8	I 15.5	15 40
8 30	0 58.0	0 59.3	I 00.7	I 02.3	I 04.0	I 06.0	I 08.1	I 10.5	I 13.1	15 30
8 40	0 56.0	0 57.2	0 58.6	I 00.1	I 01.8	I 03.7	I 05.7	I 08.0	I 10.5	15 20
8 50	0 53.9	0 55.0	0 56.4	0 57.8	0 59.5	I 01.2	I 03.2	I 05.4	I 07.8	15 10
9 00	0 51.6	0 52.8	0 54.1	0 55.4	0 57.0	0 58.7	I 00.6	I 02.7	I 05.0	15 00
9 10	0 49.3	0 50.4	0 51.6	0 52.9	0 54.4	0 56.1	0 57.9	0 59.9	I 02.1	14 50
9 20	0 46.9	0 47.9	0 49.1	0 50.4	0 51.8	0 53.3	0 55.0	0 56.9	0 59.1	14 40
9 30	0 44.4	0 45.4	0 46.5	0 47.7	0 49.0	0 50.5	0 52.1	0 53.9	0 55.9	14 30
9 40	0 41.8	0 42.8	0 43.8	0 44.9	0 46.2	0 47.6	0 49.1	0 50.8	0 52.6	14 20
9 50	0 39.2	0 40.0	0 41.0	0 42.1	0 43.2	0 44.6	0 46.0	0 47.5	0 49.3	14 10
10 00	0 36.4	0 37.2	0 38.1	0 39.1	0 40.2	0 41.4	0 42.7	0 44.2	0 45.8	14 00
10 10	0 33.6	0 34.4	0 35.2	0 36.1	0 37.1	0 38.2	0 39.4	0 40.8	0 42.3	13 50
10 20	0 30.8	0 31.5	0 32.2	0 33.0	0 34.0	0 35.0	0 36.1	0 37.3	0 38.7	13 40
10 30	0 27.9	0 28.5	0 29.2	0 29.9	0 30.8	0 31.7	0 32.7	0 33.8	0 35.0	13 30
10 40	0 24.9	0 25.5	0 26.1	0 26.7	0 27.5	0 28.3	0 29.2	0 30.2	0 31.3	13 20
10 50	0 21.9	0 22.4	0 22.9	0 23.5	0 24.2	0 24.9	0 25.7	0 26.6	0 27.5	13 10
11 00	0 18.8	0 19.3	0 19.7	0 20.2	0 20.8	0 21.4	0 22.1	0 22.8	0 23.7	13 00
11 10	0 15.8	0 16.1	0 16.5	0 16.9	0 17.4	0 17.9	0 18.5	0 19.1	0 19.8	12 50
11 20	0 12.7	0 12.9	0 13.2	0 13.6	0 13.9	0 14.4	0 14.8	0 15.3	0 15.9	12 40
11 30	0 09.5	0 09.7	0 09.9	0 10.2	0 10.5	0 10.8	0 11.1	0 11.5	0 11.9	12 30
11 40	0 06.3	0 06.5	0 06.6	0 06.8	0 07.0	0 07.2	0 07.4	0 07.7	0 08.0	12 20
11 50	0 03.2	0 03.3	0 03.3	0 03.4	0 03.5	0 03.6	0 03.7	0 03.8	0 04.0	12 10
12 00	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	12 00

Lat. H.A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H.A.
h m	°	°	°	°	°	°	°	°	°	h m
0 00	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	24 00
0 10	0 04.2	0 04.3	0 04.5	0 04.8	0 05.0	0 05.3	0 05.6	0 05.8	0 06.0	23 50
0 20	0 08.3	0 08.7	0 09.0	0 09.5	0 10.0	0 10.6	0 11.2	0 11.6	0 12.0	23 40
0 30	0 12.4	0 13.0	0 13.5	0 14.2	0 15.0	0 15.8	0 16.8	0 17.4	0 18.0	23 30
0 40	0 16.5	0 17.2	0 18.0	0 18.9	0 19.9	0 21.1	0 22.4	0 23.1	0 23.9	23 20
0 50	0 20.6	0 21.5	0 22.5	0 23.6	0 24.8	0 26.2	0 27.9	0 28.8	0 29.8	23 10
1 00	0 24.6	0 25.7	0 26.9	0 28.2	0 29.7	0 31.4	0 33.3	0 34.4	0 35.6	23 00

TABLE XVI, 1935

739

AZIMUTH OF POLARIS

For hour angles 0^h to 12^h *Polaris* is west of north, and for hour angles 12^h to 24^h it is east of north.

Lat. H.A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H.A.
h m										h m
1 00	0 24.6	0 25.7	0 26.9	0 28.2	0 29.7	0 31.4	0 33.3	0 34.4	0 35.6	23 00
1 10	0 28.6	0 29.8	0 31.2	0 32.7	0 34.4	0 36.4	0 38.7	0 40.0	0 41.3	22 50
1 20	0 32.5	0 33.9	0 35.5	0 37.2	0 39.2	0 41.4	0 44.0	0 45.4	0 47.0	22 40
1 30	0 36.4	0 37.9	0 39.7	0 41.6	0 43.8	0 46.3	0 49.2	0 50.8	0 52.5	22 30
1 40	0 40.2	0 41.8	0 43.8	0 45.9	0 48.4	0 51.1	0 54.3	0 56.1	0 58.0	22 20
1 50	0 43.9	0 45.7	0 47.8	0 50.1	0 52.8	0 55.8	0 59.3	1 01.2	1 03.3	22 10
2 00	0 47.5	0 49.5	0 51.7	0 54.3	0 57.1	1 00.4	1 04.2	1 06.2	1 08.5	22 00
2 10	0 51.0	0 53.2	0 55.6	0 58.3	1 01.4	1 04.9	1 08.9	1 11.1	1 13.6	21 50
2 20	0 54.4	0 56.7	0 59.3	1 02.2	1 05.5	1 09.2	1 13.5	1 15.9	1 18.4	21 40
2 30	0 57.7	1 00.1	1 02.9	1 06.0	1 09.4	1 13.4	1 17.9	1 20.5	1 23.2	21 30
2 40	1 00.9	1 03.5	1 06.4	1 09.6	1 13.3	1 17.4	1 22.2	1 24.9	1 27.8	21 20
2 50	1 04.0	1 06.7	1 09.7	1 13.1	1 17.0	1 21.3	1 26.3	1 29.1	1 32.1	21 10
3 00	1 06.9	1 09.7	1 12.9	1 16.4	1 20.5	1 25.0	1 30.3	1 33.2	1 36.3	21 00
3 10	1 09.7	1 12.7	1 15.9	1 19.6	1 23.8	1 28.6	1 34.0	1 37.1	1 40.3	20 50
3 20	1 12.4	1 15.4	1 18.8	1 22.7	1 27.0	1 31.9	1 37.6	1 40.7	1 44.1	20 40
3 30	1 14.9	1 18.0	1 21.6	1 25.5	1 30.0	1 35.1	1 40.9	1 44.2	1 47.7	20 30
3 40	1 17.3	1 20.5	1 24.1	1 28.2	1 32.9	1 38.1	1 44.1	1 47.5	1 51.1	20 20
3 50	1 19.5	1 22.8	1 26.6	1 30.8	1 35.5	1 40.9	1 47.1	1 50.5	1 54.2	20 10
4 00	1 21.6	1 25.0	1 28.8	1 33.1	1 38.0	1 43.5	1 49.8	1 53.3	1 57.1	20 00
4 10	1 23.5	1 27.0	1 30.9	1 35.3	1 40.2	1 45.9	1 52.3	1 55.9	1 59.8	19 50
4 20	1 25.2	1 28.8	1 32.8	1 37.3	1 42.3	1 48.1	1 54.6	1 58.3	2 02.2	19 40
4 30	1 26.8	1 30.4	1 34.5	1 39.0	1 44.2	1 50.0	1 56.7	2 00.4	2 04.4	19 30
4 40	1 28.2	1 31.9	1 36.0	1 40.6	1 45.8	1 51.8	1 58.6	2 02.3	2 06.4	19 20
4 50	1 29.5	1 33.2	1 37.3	1 42.0	1 47.3	1 53.3	2 00.2	2 04.0	2 08.1	19 10
5 00	1 30.6	1 34.3	1 38.5	1 43.2	1 48.6	1 54.6	2 01.5	2 05.4	2 09.5	19 00
5 10	1 31.5	1 35.2	1 39.5	1 44.2	1 49.6	1 55.7	2 02.7	2 06.6	2 10.7	18 50
5 20	1 32.2	1 36.0	1 40.2	1 45.0	1 50.4	1 56.6	2 03.6	2 07.5	2 11.7	18 40
5 30	1 32.7	1 36.5	1 40.8	1 45.6	1 51.0	1 57.2	2 04.2	2 08.2	2 12.4	18 30
5 40	1 33.1	1 36.9	1 41.2	1 46.0	1 51.4	1 57.6	2 04.7	2 08.6	2 12.8	18 20
5 50	1 33.3	1 37.1	1 41.4	1 46.2	1 51.6	1 57.8	2 04.9	2 08.8	2 13.0	18 10
6 00	1 33.3	1 37.1	1 41.4	1 46.2	1 51.6	1 57.8	2 04.8	2 08.7	2 12.9	18 00
6 10	1 33.1	1 36.9	1 41.2	1 45.9	1 51.4	1 57.5	2 04.5	2 08.4	2 12.6	17 50
6 20	1 32.8	1 36.5	1 40.8	1 45.5	1 50.9	1 57.0	2 04.0	2 07.8	2 12.0	17 40
6 30	1 32.2	1 36.0	1 40.2	1 44.9	1 50.2	1 56.3	2 03.2	2 07.0	2 11.2	17 30
6 40	1 31.5	1 35.3	1 39.4	1 44.1	1 49.4	1 55.4	2 02.2	2 06.0	2 10.1	17 20
6 50	1 30.7	1 34.3	1 38.5	1 43.1	1 48.3	1 54.3	2 01.0	2 04.8	2 08.8	17 10
7 00	1 29.6	1 33.2	1 37.3	1 41.9	1 47.1	1 52.9	1 59.6	2 03.3	2 07.2	17 00
7 10	1 28.4	1 32.0	1 36.0	1 40.5	1 45.6	1 51.3	1 57.9	2 01.5	2 05.4	16 50
7 20	1 27.1	1 30.6	1 34.5	1 38.9	1 43.9	1 49.6	1 56.0	1 59.6	2 03.4	16 40
7 30	1 25.5	1 29.0	1 32.8	1 37.2	1 42.0	1 47.6	1 53.9	1 57.4	2 01.2	16 30
7 40	1 23.8	1 27.2	1 31.0	1 35.2	1 40.0	1 45.4	1 51.6	1 55.0	1 58.8	16 20
7 50	1 22.0	1 25.3	1 29.0	1 33.1	1 37.8	1 43.1	1 49.1	1 52.5	1 56.1	16 10
8 00	1 20.0	1 23.2	1 26.8	1 30.8	1 35.4	1 40.5	1 46.4	1 49.7	1 53.2	16 00
8 10	1 17.8	1 21.0	1 24.4	1 28.3	1 32.8	1 37.8	1 43.5	1 46.7	1 50.1	15 50
8 20	1 15.5	1 18.6	1 21.9	1 25.7	1 30.0	1 34.9	1 40.4	1 43.5	1 46.8	15 40
8 30	1 13.1	1 16.0	1 19.3	1 23.0	1 27.1	1 31.8	1 37.1	1 40.1	1 43.3	15 30
8 40	1 10.5	1 13.3	1 16.5	1 20.1	1 24.0	1 28.6	1 33.7	1 36.5	1 39.6	15 20
8 50	1 07.8	1 10.5	1 13.6	1 17.0	1 20.8	1 25.2	1 30.1	1 32.8	1 35.8	15 10
9 00	1 05.0	1 07.6	1 10.5	1 13.8	1 17.5	1 21.6	1 26.4	1 29.0	1 31.8	15 00
9 10	1 02.1	1 04.6	1 07.3	1 10.4	1 14.0	1 17.9	1 22.4	1 24.9	1 27.6	14 50
9 20	0 59.1	1 01.4	1 04.0	1 07.0	1 10.3	1 14.1	1 18.4	1 20.7	1 23.3	14 40
9 30	0 55.9	0 58.1	1 00.6	1 03.4	1 06.5	1 10.1	1 14.2	1 16.4	1 18.8	14 30
9 40	0 52.6	0 54.7	0 57.1	0 59.7	1 02.6	1 06.0	1 09.8	1 11.9	1 14.2	14 20
9 50	0 49.3	0 51.2	0 53.4	0 55.9	0 58.6	1 01.8	1 05.3	1 07.3	1 09.4	14 10
10 00	0 45.8	0 47.7	0 49.7	0 52.0	0 54.5	0 57.4	1 00.7	1 02.6	1 04.6	14 00

TABLE XVI, 1935

AZIMUTH OF POLARIS

For hour angles 0^h to 12^h *Polaris* is west of north, and for hour angles 12^h to 24^h it is east of north.

Lat. H.A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H.A.
^h ^m										^h ^m
10 00	0 45.8	0 47.7	0 49.7	0 52.0	0 54.5	0 57.4	1 00.7	1 02.6	1 04.6	14 00
10 10	0 42.3	0 44.0	0 45.9	0 48.0	0 50.3	0 53.0	0 56.1	0 57.8	0 59.6	13 50
10 20	0 38.7	0 40.2	0 42.0	0 43.9	0 46.1	0 48.5	0 51.3	0 52.8	0 54.5	13 40
10 30	0 35.0	0 36.4	0 38.0	0 39.7	0 41.7	0 43.9	0 46.4	0 47.8	0 49.3	13 30
10 40	0 31.3	0 32.5	0 34.0	0 35.5	0 37.2	0 39.2	0 41.5	0 42.7	0 44.1	13 20
10 50	0 27.5	0 28.6	0 29.8	0 31.2	0 32.7	0 34.5	0 36.5	0 37.5	0 38.7	13 10
11 00	0 23.7	0 24.6	0 25.7	0 26.8	0 28.2	0 29.7	0 31.4	0 32.3	0 33.3	13 00
11 10	0 19.8	0 20.6	0 21.5	0 22.4	0 23.5	0 24.8	0 26.2	0 27.0	0 27.8	12 50
11 20	0 15.9	0 16.5	0 17.2	0 18.0	0 18.9	0 19.9	0 21.0	0 21.7	0 22.3	12 40
11 30	0 11.9	0 12.4	0 12.9	0 13.5	0 14.2	0 14.9	0 15.8	0 16.3	0 16.8	12 30
11 40	0 08.0	0 08.3	0 08.6	0 09.0	0 09.5	0 10.0	0 10.5	0 10.9	0 11.2	12 20
11 50	0 04.0	0 04.2	0 04.3	0 04.5	0 04.8	0 05.0	0 05.3	0 05.4	0 05.6	12 10
12 00	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	12 00
Lat. H.A.	62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. H.A.
^h ^m										^h ^m
0 00	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	24 00
0 10	0 06.0	0 06.2	0 06.5	0 06.7	0 07.0	0 07.3	0 07.6	0 08.0	0 08.4	23 50
0 20	0 12.0	0 12.4	0 12.9	0 13.4	0 14.0	0 14.5	0 15.2	0 15.9	0 16.8	23 40
0 30	0 18.0	0 18.6	0 19.3	0 20.1	0 20.9	0 21.8	0 22.8	0 23.8	0 25.1	23 30
0 40	0 23.9	0 24.8	0 25.7	0 26.7	0 27.8	0 29.0	0 30.3	0 31.7	0 33.3	23 20
0 50	0 29.8	0 30.8	0 32.0	0 33.2	0 34.6	0 36.1	0 37.7	0 39.5	0 41.5	23 10
1 00	0 35.6	0 36.8	0 38.2	0 39.7	0 41.3	0 43.1	0 45.1	0 47.2	0 49.6	23 00
1 10	0 41.3	0 42.8	0 44.4	0 46.1	0 48.0	0 50.1	0 52.4	0 54.8	0 57.6	22 50
1 20	0 47.0	0 48.6	0 50.5	0 52.4	0 54.6	0 56.9	0 59.5	1 02.3	1 05.5	22 40
1 30	0 52.5	0 54.4	0 56.4	0 58.6	1 01.0	1 03.6	1 06.5	1 09.7	1 13.2	22 30
1 40	0 58.0	1 00.1	1 02.3	1 04.7	1 07.3	1 10.2	1 13.4	1 16.9	1 20.8	22 20
1 50	1 03.3	1 05.6	1 08.0	1 10.6	1 13.5	1 16.7	1 20.1	1 23.9	1 28.2	22 10
2 00	1 08.5	1 10.9	1 13.6	1 16.4	1 19.5	1 22.9	1 26.7	1 30.8	1 35.4	22 00
2 10	1 13.6	1 16.2	1 19.0	1 22.1	1 25.4	1 29.0	1 33.1	1 37.5	1 42.4	21 50
2 20	1 18.4	1 21.2	1 24.2	1 27.5	1 31.1	1 35.0	1 39.2	1 43.9	1 49.1	21 40
2 30	1 23.2	1 26.1	1 29.3	1 32.8	1 36.5	1 40.6	1 45.2	1 50.1	1 55.6	21 30
2 40	1 27.8	1 30.9	1 34.2	1 37.8	1 41.8	1 46.1	1 50.9	1 56.1	2 01.9	21 20
2 50	1 32.1	1 35.4	1 38.9	1 42.7	1 46.9	1 51.4	1 56.4	2 01.9	2 08.0	21 10
3 00	1 36.3	1 39.7	1 43.4	1 47.4	1 51.7	1 56.4	2 01.6	2 07.4	2 13.7	21 00
3 10	1 40.3	1 43.8	1 47.7	1 51.8	1 56.3	2 01.2	2 06.6	2 12.6	2 19.2	20 50
3 20	1 44.1	1 47.8	1 51.7	1 56.0	2 00.7	2 05.8	2 11.4	2 17.6	2 24.4	20 40
3 30	1 47.7	1 51.5	1 55.5	2 00.0	2 04.8	2 10.1	2 15.8	2 22.2	2 29.2	20 30
3 40	1 51.1	1 55.0	1 59.1	2 03.7	2 08.7	2 14.1	2 20.0	2 26.6	2 33.8	20 20
3 50	1 54.2	1 58.2	2 02.5	2 07.2	2 12.3	2 17.8	2 23.9	2 30.6	2 38.1	20 10
4 00	1 57.1	2 01.2	2 05.6	2 10.4	2 15.6	2 21.3	2 27.5	2 34.4	2 42.0	20 00
4 10	1 59.8	2 03.9	2 08.5	2 13.4	2 18.7	2 24.5	2 30.8	2 37.9	2 45.6	19 50
4 20	2 02.2	2 06.5	2 11.1	2 16.1	2 21.5	2 27.4	2 33.8	2 41.0	2 48.8	19 40
4 30	2 04.4	2 08.7	2 13.4	2 18.5	2 24.0	2 30.0	2 36.5	2 43.8	2 51.8	19 30
4 40	2 06.4	2 10.7	2 15.5	2 20.6	2 26.2	2 32.3	2 38.9	2 46.3	2 54.4	19 20
4 50	2 08.1	2 12.5	2 17.3	2 22.5	2 28.1	2 34.3	2 41.0	2 48.4	2 56.6	19 10
5 00	2 09.5	2 14.0	2 18.8	2 24.0	2 29.7	2 35.9	2 42.7	2 50.2	2 58.5	19 00
5 10	2 10.7	2 15.2	2 20.1	2 25.3	2 31.1	2 37.3	2 44.1	2 51.7	3 00.0	18 50
5 20	2 11.7	2 16.2	2 21.1	2 26.4	2 32.1	2 38.4	2 45.3	2 52.8	3 01.1	18 40
5 30	2 12.4	2 16.9	2 21.8	2 27.1	2 32.9	2 39.2	2 46.1	2 53.6	3 02.0	18 30
5 40	2 12.8	2 17.3	2 22.2	2 27.5	2 33.3	2 39.6	2 46.5	2 54.1	3 02.4	18 20
5 50	2 13.0	2 17.5	2 22.4	2 27.7	2 33.5	2 39.8	2 46.7	2 54.2	3 02.6	18 10
6 00	2 12.9	2 17.4	2 22.3	2 27.6	2 33.4	2 39.6	2 46.5	2 54.0	3 02.3	18 00

TABLE XVI, 1935

741

AZIMUTH OF POLARIS

For hour angles 0^h to 12^h *Polaris* is west of north, and for hour angles 12^h to 24^h it is east of north.

Lat. H.A.	62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. H.A.
h^m	s	s	s	s	s	s	s	s	s	h^m
6 00	2 12.9	2 17.4	2 22.3	2 27.6	2 33.4	2 39.6	2 46.5	2 54.0	3 02.3	18 00
6 10	2 12.6	2 17.1	2 22.0	2 27.2	2 33.0	2 39.2	2 46.0	2 53.5	3 01.8	17 50
6 20	2 12.0	2 16.5	2 21.3	2 26.5	2 32.3	2 38.4	2 45.2	2 52.7	3 00.9	17 40
6 30	2 11.2	2 15.6	2 20.4	2 25.6	2 31.3	2 37.4	2 44.1	2 51.5	2 59.6	17 30
6 40	2 10.1	2 14.5	2 19.2	2 24.4	2 30.0	2 36.1	2 42.7	2 50.0	2 58.0	17 20
6 50	2 08.8	2 13.2	2 17.8	2 22.9	2 28.4	2 34.4	2 41.0	2 48.2	2 56.1	17 10
7 00	2 07.2	2 11.5	2 16.2	2 21.2	2 26.6	2 32.5	2 39.0	2 46.1	2 53.9	17 00
7 10	2 05.4	2 09.7	2 14.2	2 19.2	2 24.5	2 30.3	2 36.7	2 43.7	2 51.3	16 50
7 20	2 03.4	2 07.6	2 12.1	2 16.9	2 22.1	2 27.9	2 34.1	2 41.0	2 48.5	16 40
7 30	2 01.2	2 05.3	2 09.7	2 14.4	2 19.5	2 25.1	2 31.2	2 38.0	2 45.3	16 30
7 40	1 58.8	2 02.7	2 07.0	2 11.6	2 16.7	2 22.1	2 28.1	2 34.7	2 41.9	16 20
7 50	1 56.1	1 59.9	2 04.1	2 08.7	2 13.6	2 18.9	2 24.7	2 31.1	2 38.1	16 10
8 00	1 53.2	1 56.9	2 01.0	2 05.4	2 10.2	2 15.4	2 21.1	2 27.3	2 34.1	16 00
8 10	1 50.1	1 53.7	1 57.7	2 02.0	2 06.6	2 11.7	2 17.2	2 23.2	2 29.8	15 50
8 20	1 46.8	1 50.3	1 54.2	1 58.3	2 02.8	2 07.7	2 13.0	2 18.8	2 25.3	15 40
8 30	1 43.3	1 46.7	1 50.4	1 54.4	1 58.7	2 03.5	2 08.6	2 14.2	2 20.4	15 30
8 40	1 39.6	1 43.0	1 46.5	1 50.3	1 54.5	1 59.1	2 04.0	2 09.4	2 15.4	15 20
8 50	1 35.8	1 39.0	1 42.4	1 46.1	1 50.1	1 54.4	1 59.2	2 04.4	2 10.1	15 10
9 00	1 31.8	1 34.8	1 38.1	1 41.6	1 45.5	1 49.6	1 54.2	1 59.1	2 04.6	15 00
9 10	1 27.6	1 30.5	1 33.6	1 37.0	1 40.6	1 44.6	1 48.9	1 53.7	1 58.9	14 50
9 20	1 23.3	1 26.0	1 29.0	1 32.2	1 35.6	1 39.4	1 43.5	1 48.0	1 53.0	14 40
9 30	1 18.8	1 21.4	1 24.2	1 27.2	1 30.5	1 34.0	1 37.9	1 42.2	1 46.9	14 30
9 40	1 14.2	1 16.6	1 19.2	1 22.1	1 25.2	1 28.5	1 32.1	1 36.2	1 40.6	14 20
9 50	1 09.4	1 11.7	1 14.2	1 16.8	1 19.7	1 22.8	1 26.2	1 30.0	1 34.1	14 10
10 00	1 04.6	1 06.7	1 09.0	1 11.4	1 14.1	1 17.0	1 20.2	1 23.6	1 27.5	14 00
10 10	0 59.6	1 01.5	1 03.7	1 05.9	1 08.4	1 11.1	1 14.0	1 17.2	1 20.7	13 50
10 20	0 54.5	0 56.3	0 58.2	1 00.3	1 02.6	1 05.0	1 07.7	1 10.6	1 13.8	13 40
10 30	0 49.3	0 50.9	0 52.7	0 54.6	0 56.6	0 58.8	1 01.2	1 03.8	1 06.8	13 30
10 40	0 44.1	0 45.5	0 47.1	0 48.7	0 50.5	0 52.5	0 54.7	0 57.0	0 59.6	13 20
10 50	0 38.7	0 40.0	0 41.4	0 42.8	0 44.4	0 46.1	0 48.0	0 50.1	0 52.4	13 10
11 00	0 33.3	0 34.4	0 35.6	0 36.8	0 38.2	0 39.7	0 41.3	0 43.1	0 45.1	13 00
11 10	0 27.8	0 28.8	0 29.7	0 30.8	0 32.0	0 33.2	0 34.6	0 36.0	0 37.7	12 50
11 20	0 22.3	0 23.1	0 23.9	0 24.7	0 25.6	0 26.6	0 27.7	0 28.9	0 30.2	12 40
11 30	0 16.8	0 17.3	0 17.9	0 18.6	0 19.3	0 20.0	0 20.8	0 21.7	0 22.7	12 30
11 40	0 11.2	0 11.6	0 12.0	0 12.4	0 12.9	0 13.4	0 13.9	0 14.5	0 15.2	12 20
11 50	0 05.6	0 05.8	0 06.0	0 06.2	0 06.4	0 06.7	0 06.9	0 07.3	0 07.6	12 10
12 00	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00.0	12 00

TABLE XVIIA

Table XVI has been computed for a declination of $88^\circ 57' 35''$. For other declinations of *Polaris* the corrections given below should be applied.

Azimuth Dec.	0'	20'	40'	60'	80'	100'	120'	140'	160'	180'	200'
88 57 10	0.0	+0.1	+0.3	+0.4	+0.5	+0.7	+0.8	+0.9	+1.1	+1.2	+1.3
88 57 15	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.1
88 57 20	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.6	0.6	0.7	0.8
88 57 25	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
88 57 30	0.0	+0.0	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	+0.3
88 57 35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88 57 40	0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.3
88 57 45	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
88 57 50	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.8
88 57 55	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.1
88 58 00	0.0	-0.1	-0.3	-0.4	-0.5	-0.7	-0.8	-0.9	-1.1	-1.2	-1.3

BESSELIAN COEFFICIENT OF THE DOUBLE SECOND DIFFERENCE

The coefficient is always negative.

<i>n</i>	<i>B"</i>	<i>n</i>	<i>n</i>	<i>B"</i>	<i>n</i>	<i>n</i>	<i>B"</i>	<i>n</i>
0.00000	—	1.00000	0.02187	—	0.97813	0.04502	—	0.95498
0.00020	0.0000	0.99980	0.02229	0.0054	0.97771	0.04546	0.0108	0.95454
0.00060	0.0001	0.99940	0.02271	0.0055	0.97729	0.04590	0.0109	0.95410
0.00100	0.0002	0.99900	0.02313	0.0056	0.97687	0.04634	0.0110	0.95366
0.00140	0.0003	0.99860	0.02355	0.0057	0.97645	0.04678	0.0111	0.95322
0.00180	0.0004	0.99820	0.02397	0.0058	0.97603	0.04723	0.0112	0.95277
0.00220	0.0005	0.99780	0.02439	0.0059	0.97561	0.04767	0.0113	0.95233
0.00260	0.0006	0.99740	0.02481	0.0060	0.97519	0.04811	0.0114	0.95189
0.00300	0.0007	0.99700	0.02523	0.0061	0.97477	0.04855	0.0115	0.95145
0.00341	0.0008	0.99659	0.02565	0.0062	0.97435	0.04900	0.0116	0.95100
0.00381	0.0009	0.99619	0.02608	0.0063	0.97392	0.04944	0.0117	0.95056
0.00421	0.0010	0.99579	0.02650	0.0064	0.97350	0.04988	0.0118	0.95012
0.00462	0.0011	0.99538	0.02692	0.0065	0.97308	0.05033	0.0119	0.94967
0.00502	0.0012	0.99498	0.02734	0.0066	0.97266	0.05077	0.0120	0.94923
0.00542	0.0013	0.99458	0.02777	0.0067	0.97223	0.05122	0.0121	0.94878
0.00583	0.0014	0.99417	0.02819	0.0068	0.97181	0.05166	0.0122	0.94834
0.00623	0.0015	0.99377	0.02861	0.0069	0.97139	0.05211	0.0123	0.94789
0.00664	0.0016	0.99336	0.02904	0.0070	0.97096	0.05256	0.0124	0.94744
0.00704	0.0017	0.99296	0.02946	0.0071	0.97054	0.05301	0.0125	0.94699
0.00745	0.0018	0.99255	0.02989	0.0072	0.97011	0.05345	0.0126	0.94655
0.00786	0.0019	0.99214	0.03031	0.0073	0.96969	0.05390	0.0127	0.94610
0.00826	0.0020	0.99174	0.03074	0.0074	0.96926	0.05435	0.0128	0.94565
0.00867	0.0021	0.99133	0.03117	0.0075	0.96883	0.05480	0.0129	0.94520
0.00908	0.0022	0.99092	0.03159	0.0076	0.96841	0.05525	0.0130	0.94475
0.00949	0.0023	0.99051	0.03202	0.0077	0.96798	0.05570	0.0131	0.94430
0.00989	0.0024	0.99011	0.03245	0.0078	0.96755	0.05615	0.0132	0.94385
0.01030	0.0025	0.98970	0.03288	0.0079	0.96712	0.05660	0.0133	0.94340
0.01071	0.0026	0.98929	0.03330	0.0080	0.96670	0.05705	0.0134	0.94295
0.01112	0.0027	0.98888	0.03373	0.0081	0.96627	0.05750	0.0135	0.94250
0.01153	0.0028	0.98847	0.03416	0.0082	0.96584	0.05795	0.0136	0.94205
0.01194	0.0029	0.98806	0.03459	0.0083	0.96541	0.05841	0.0137	0.94159
0.01235	0.0030	0.98765	0.03502	0.0084	0.96498	0.05886	0.0138	0.94114
0.01276	0.0031	0.98724	0.03545	0.0085	0.96455	0.05931	0.0139	0.94069
0.01317	0.0032	0.98683	0.03588	0.0086	0.96412	0.05977	0.0140	0.94023
0.01358	0.0033	0.98642	0.03631	0.0087	0.96369	0.06022	0.0141	0.93978
0.01399	0.0034	0.98601	0.03675	0.0088	0.96325	0.06068	0.0142	0.93932
0.01440	0.0035	0.98560	0.03718	0.0089	0.96282	0.06113	0.0143	0.93887
0.01481	0.0036	0.98519	0.03761	0.0090	0.96239	0.06159	0.0144	0.93841
0.01523	0.0037	0.98477	0.03804	0.0091	0.96196	0.06205	0.0145	0.93795
0.01564	0.0038	0.98436	0.03848	0.0092	0.96152	0.06250	0.0146	0.93750
0.01605	0.0039	0.98395	0.03891	0.0093	0.96109	0.06296	0.0147	0.93704
0.01647	0.0040	0.98353	0.03934	0.0094	0.96066	0.06342	0.0148	0.93658
0.01688	0.0041	0.98312	0.03978	0.0095	0.96022	0.06388	0.0149	0.93612
0.01729	0.0042	0.98271	0.04021	0.0096	0.95979	0.06433	0.0150	0.93567
0.01771	0.0043	0.98229	0.04065	0.0097	0.95935	0.06479	0.0151	0.93521
0.01812	0.0044	0.98188	0.04108	0.0098	0.95892	0.06525	0.0152	0.93475
0.01854	0.0045	0.98146	0.04152	0.0099	0.95848	0.06571	0.0153	0.93429
0.01895	0.0046	0.98105	0.04196	0.0100	0.95804	0.06617	0.0154	0.93383
0.01937	0.0047	0.98063	0.04239	0.0101	0.95761	0.06664	0.0155	0.93336
0.01979	0.0048	0.98021	0.04283	0.0102	0.95717	0.06710	0.0156	0.93290
0.02020	0.0049	0.97980	0.04327	0.0103	0.95673	0.06756	0.0157	0.93244
0.02062	0.0050	0.97938	0.04371	0.0104	0.95629	0.06802	0.0158	0.93198
0.02104	0.0051	0.97896	0.04414	0.0105	0.95586	0.06849	0.0159	0.93151
0.02146	0.0052	0.97854	0.04458	0.0106	0.95542	0.06895	0.0160	0.93105
0.02187	0.0053	0.97813	0.04502	0.0107	0.95498	0.06941	0.0161	0.93059

In critical cases ascend.

TABLE XVII

743

BESSELIAN COEFFICIENT OF THE DOUBLE SECOND DIFFERENCE

The coefficient is always negative.

<i>n</i>	<i>B"</i>	<i>n</i>	<i>n</i>	<i>B"</i>	<i>n</i>	<i>n</i>	<i>B"</i>	<i>n</i>
0.06895	—	0.93105	0.09330	—	0.90670	0.11921	—	0.88079
0.06941	0.0161	0.93059	0.09379	0.0212	0.90621	0.11973	0.0263	0.88027
0.06988	0.0162	0.93012	0.09429	0.0213	0.90571	0.12026	0.0264	0.87974
0.07034	0.0163	0.92966	0.09478	0.0214	0.90522	0.12079	0.0265	0.87921
0.07081	0.0164	0.92919	0.09527	0.0215	0.90473	0.12131	0.0266	0.87869
0.07128	0.0165	0.92872	0.09577	0.0216	0.90423	0.12184	0.0267	0.87816
0.07174	0.0166	0.92826	0.09626	0.0217	0.90374	0.12237	0.0268	0.87763
0.07221	0.0167	0.92779	0.09676	0.0218	0.90324	0.12290	0.0269	0.87710
0.07268	0.0168	0.92732	0.09725	0.0219	0.90275	0.12343	0.0270	0.87657
0.07315	0.0169	0.92685	0.09775	0.0220	0.90225	0.12396	0.0271	0.87604
0.07361	0.0170	0.92639	0.09825	0.0221	0.90175	0.12450	0.0272	0.87550
0.07408	0.0171	0.92592	0.09875	0.0222	0.90125	0.12503	0.0273	0.87497
0.07455	0.0172	0.92545	0.09925	0.0223	0.90075	0.12556	0.0274	0.87444
0.07502	0.0173	0.92498	0.09975	0.0224	0.90025	0.12610	0.0275	0.87390
0.07550	0.0174	0.92450	0.10025	0.0225	0.89975	0.12663	0.0276	0.87337
0.07597	0.0175	0.92403	0.10075	0.0226	0.89925	0.12717	0.0277	0.87283
0.07644	0.0176	0.92356	0.10125	0.0227	0.89875	0.12770	0.0278	0.87230
0.07691	0.0177	0.92309	0.10175	0.0228	0.89825	0.12824	0.0279	0.87176
0.07738	0.0178	0.92262	0.10225	0.0229	0.89775	0.12878	0.0280	0.87122
0.07786	0.0179	0.92214	0.10275	0.0230	0.89725	0.12932	0.0281	0.87068
0.07833	0.0180	0.92167	0.10326	0.0231	0.89674	0.12986	0.0282	0.87014
0.07881	0.0181	0.92119	0.10376	0.0232	0.89624	0.13040	0.0283	0.86960
0.07928	0.0182	0.92072	0.10427	0.0233	0.89573	0.13094	0.0284	0.86906
0.07976	0.0183	0.92024	0.10477	0.0234	0.89523	0.13148	0.0285	0.86852
0.08023	0.0184	0.91977	0.10528	0.0235	0.89472	0.13203	0.0286	0.86797
0.08071	0.0185	0.91929	0.10579	0.0236	0.89421	0.13257	0.0287	0.86743
0.08119	0.0186	0.91881	0.10629	0.0237	0.89371	0.13312	0.0288	0.86688
0.08166	0.0187	0.91834	0.10680	0.0238	0.89320	0.13366	0.0289	0.86634
0.08214	0.0188	0.91786	0.10731	0.0239	0.89269	0.13421	0.0290	0.86579
0.08262	0.0189	0.91738	0.10782	0.0240	0.89218	0.13476	0.0291	0.86524
0.08310	0.0190	0.91690	0.10833	0.0241	0.89167	0.13530	0.0292	0.86470
0.08358	0.0191	0.91642	0.10884	0.0242	0.89116	0.13585	0.0293	0.86415
0.08406	0.0192	0.91594	0.10935	0.0243	0.89065	0.13640	0.0294	0.86360
0.08454	0.0193	0.91546	0.10987	0.0244	0.89013	0.13695	0.0295	0.86305
0.08503	0.0194	0.91497	0.11038	0.0245	0.88962	0.13750	0.0296	0.86250
0.08551	0.0195	0.91449	0.11089	0.0246	0.88911	0.13806	0.0297	0.86194
0.08599	0.0196	0.91401	0.11141	0.0247	0.88859	0.13861	0.0298	0.86139
0.08647	0.0197	0.91353	0.11192	0.0248	0.88808	0.13916	0.0299	0.86084
0.08696	0.0198	0.91304	0.11244	0.0249	0.88756	0.13972	0.0300	0.86028
0.08744	0.0199	0.91256	0.11295	0.0250	0.88705	0.14027	0.0301	0.85973
0.08793	0.0200	0.91207	0.11347	0.0251	0.88653	0.14083	0.0302	0.85917
0.08841	0.0201	0.91159	0.11399	0.0252	0.88601	0.14139	0.0303	0.85861
0.08890	0.0202	0.91110	0.11451	0.0253	0.88549	0.14194	0.0304	0.85806
0.08939	0.0203	0.91061	0.11503	0.0254	0.88497	0.14250	0.0305	0.85750
0.08987	0.0204	0.91013	0.11555	0.0255	0.88445	0.14306	0.0306	0.85694
0.09036	0.0205	0.90964	0.11607	0.0256	0.88393	0.14362	0.0307	0.85638
0.09085	0.0206	0.90915	0.11659	0.0257	0.88341	0.14419	0.0308	0.85581
0.09134	0.0207	0.90866	0.11711	0.0258	0.88289	0.14475	0.0309	0.85525
0.09183	0.0208	0.90817	0.11763	0.0259	0.88237	0.14531	0.0310	0.85469
0.09232	0.0209	0.90768	0.11816	0.0260	0.88184	0.14588	0.0311	0.85412
0.09281	0.0210	0.90719	0.11868	0.0261	0.88132	0.14644	0.0312	0.85356
0.09330	0.0211	0.90670	0.11921	0.0262	0.88079	0.14701	0.0313	0.85299

In critical cases ascend.

$$f_n = f_0 + n\Delta' + B''(\Delta_0'' + \Delta_1'') + B''' \Delta''' + B^{(4)}(\Delta_0^{(4)} + \Delta_1^{(4)})$$

BESSELIAN COEFFICIENT OF THE DOUBLE SECOND DIFFERENC

The coefficient is always negative.

<i>n</i>	<i>B"</i>	<i>n</i>	<i>n</i>	<i>B"</i>	<i>n</i>	<i>n</i>	<i>B"</i>	<i>n</i>
0.14588	—	0.85412	0.17781	—	0.82219	0.21329	—	0.7867
0.14644	0.0312	0.85356	0.17844	0.0366	0.82156	0.21399	0.0420	0.7860
0.14701	0.0313	0.85299	0.17906	0.0367	0.82094	0.21469	0.0421	0.7853
0.14757	0.0314	0.85243	0.17968	0.0368	0.82032	0.21539	0.0422	0.7846
0.14814	0.0315	0.85186	0.18031	0.0369	0.81969	0.21609	0.0423	0.7839
0.14871	0.0316	0.85129	0.18093	0.0370	0.81907	0.21680	0.0424	0.7832
0.14928	0.0317	0.85072	0.18156	0.0371	0.81844	0.21751	0.0425	0.7824
0.14985	0.0318	0.85015	0.18219	0.0372	0.81781	0.21821	0.0426	0.7817
0.15042	0.0319	0.84958	0.18282	0.0373	0.81718	0.21893	0.0427	0.7810
0.15100	0.0320	0.84900	0.18345	0.0374	0.81655	0.21964	0.0428	0.7803
0.15157	0.0321	0.84843	0.18408	0.0375	0.81592	0.22035	0.0429	0.7796
0.15214	0.0322	0.84786	0.18472	0.0376	0.81528	0.22107	0.0430	0.7789
0.15272	0.0323	0.84728	0.18535	0.0377	0.81465	0.22179	0.0431	0.7782
0.15330	0.0324	0.84670	0.18599	0.0378	0.81401	0.22251	0.0432	0.7774
0.15387	0.0325	0.84613	0.18663	0.0379	0.81337	0.22323	0.0433	0.7767
0.15445	0.0326	0.84555	0.18727	0.0380	0.81273	0.22395	0.0434	0.7760
0.15503	0.0327	0.84497	0.18791	0.0381	0.81209	0.22468	0.0435	0.7753
0.15561	0.0328	0.84439	0.18855	0.0382	0.81145	0.22540	0.0436	0.7746
0.15619	0.0329	0.84381	0.18919	0.0383	0.81081	0.22613	0.0437	0.7738
0.15677	0.0330	0.84323	0.18983	0.0384	0.81017	0.22686	0.0438	0.7731
0.15736	0.0331	0.84264	0.19048	0.0385	0.80952	0.22760	0.0439	0.7724
0.15794	0.0332	0.84206	0.19113	0.0386	0.80887	0.22833	0.0440	0.7716
0.15853	0.0333	0.84147	0.19177	0.0387	0.80823	0.22907	0.0441	0.7709
0.15911	0.0334	0.84089	0.19242	0.0388	0.80758	0.22981	0.0442	0.7701
0.15970	0.0335	0.84030	0.19307	0.0389	0.80693	0.23055	0.0443	0.7694
0.16029	0.0336	0.83971	0.19373	0.0390	0.80627	0.23129	0.0444	0.7687
0.16088	0.0337	0.83912	0.19438	0.0391	0.80562	0.23204	0.0445	0.7679
0.16147	0.0338	0.83853	0.19504	0.0392	0.80496	0.23279	0.0446	0.7672
0.16206	0.0339	0.83794	0.19569	0.0393	0.80431	0.23354	0.0447	0.7664
0.16265	0.0340	0.83735	0.19635	0.0394	0.80365	0.23429	0.0448	0.7657
0.16325	0.0341	0.83675	0.19701	0.0395	0.80299	0.23504	0.0449	0.7649
0.16384	0.0342	0.83616	0.19767	0.0396	0.80233	0.23580	0.0450	0.7642
0.16444	0.0343	0.83556	0.19833	0.0397	0.80167	0.23656	0.0451	0.7634
0.16503	0.0344	0.83497	0.19898	0.0398	0.80100	0.23732	0.0452	0.7626
0.16563	0.0345	0.83437	0.19966	0.0399	0.80034	0.23808	0.0453	0.7619
0.16623	0.0346	0.83377	0.20033	0.0400	0.79967	0.23884	0.0454	0.7611
0.16683	0.0347	0.83317	0.20100	0.0401	0.79900	0.23961	0.0455	0.7603
0.16743	0.0348	0.83257	0.20167	0.0402	0.79833	0.24038	0.0456	0.7596
0.16803	0.0349	0.83197	0.20234	0.0403	0.79766	0.24115	0.0457	0.7588
0.16863	0.0350	0.83137	0.20301	0.0404	0.79699	0.24193	0.0458	0.7580
0.16924	0.0351	0.83076	0.20368	0.0405	0.79632	0.24270	0.0459	0.7572
0.16984	0.0352	0.83016	0.20436	0.0406	0.79564	0.24348	0.0460	0.7564
0.17045	0.0353	0.82955	0.20504	0.0407	0.79496	0.24426	0.0461	0.7557
0.17106	0.0354	0.82894	0.20572	0.0408	0.79428	0.24504	0.0462	0.7549
0.17167	0.0355	0.82833	0.20640	0.0409	0.79360	0.24583	0.0463	0.7541
0.17228	0.0356	0.82772	0.20708	0.0410	0.79292	0.24662	0.0464	0.7533
0.17289	0.0357	0.82711	0.20776	0.0411	0.79224	0.24741	0.0465	0.7525
0.17350	0.0358	0.82650	0.20845	0.0412	0.79155	0.24820	0.0466	0.7518
0.17411	0.0359	0.82589	0.20913	0.0413	0.79087	0.24900	0.0467	0.7510
0.17473	0.0360	0.82527	0.20982	0.0414	0.79018	0.24980	0.0468	0.7502
0.17534	0.0361	0.82466	0.21051	0.0415	0.78949	0.25060	0.0469	0.7494
0.17596	0.0362	0.82404	0.21120	0.0416	0.78880	0.25140	0.0470	0.7486
0.17658	0.0363	0.82342	0.21190	0.0417	0.78810	0.25220	0.0471	0.7478
0.17719	0.0364	0.82281	0.21259	0.0418	0.78741	0.25301	0.0472	0.7469
0.17781	0.0365	0.82219	0.21329	0.0419	0.78671	0.25382	0.0473	0.7461

In critical cases ascend.

TABLE XVII

745

BESSELIAN COEFFICIENT OF THE DOUBLE SECOND DIFFERENCE

The coefficient is always negative.

<i>n</i>	<i>B'</i>	<i>n</i>	<i>n</i>	<i>B'</i>	<i>n</i>	<i>n</i>	<i>B'</i>	<i>n</i>
0.25301	—	0.74699	0.29850	—	0.70150	0.35787	—	0.64213
.25382	0.0473	.74618	.29950	0.0524	.70050	.35928	0.0575	.64072
.25464	.0474	.74536	.30050	.0525	.69950	.36071	.0576	.63929
.25545	.0475	.74455	.30150	.0526	.69850	.36215	.0577	.63785
.25627	.0476	.74373	.30251	.0527	.69749	.36361	.0578	.63639
.25710	.0477	.74290	.30353	.0528	.69647	.36509	.0579	.63491
.25792	.0478	.74208	.30455	.0529	.69545	.36658	.0580	.63342
.25875	.0479	.74125	.30557	.0530	.69443	.36809	.0581	.63191
.25958	.0480	.74042	.30660	.0531	.69340	.36961	.0582	.63039
.26041	.0481	.73959	.30764	.0532	.69236	.37115	.0583	.62885
.26125	.0482	.73875	.30868	.0533	.69132	.37272	.0584	.62728
.26209	.0483	.73791	.30973	.0534	.69027	.37430	.0585	.62570
.26293	.0484	.73707	.31079	.0535	.68921	.37590	.0586	.62410
.26377	.0485	.73623	.31185	.0536	.68815	.37752	.0587	.62248
.26462	.0486	.73538	.31291	.0537	.68709	.37916	.0588	.62084
.26547	.0487	.73458	.31398	.0538	.68602	.38083	.0589	.61917
.26633	.0488	.73367	.31506	.0539	.68494	.38252	.0590	.61748
.26719	.0489	.73281	.31615	.0540	.68385	.38424	.0591	.61576
.26805	.0490	.73195	.31724	.0541	.68276	.38598	.0592	.61402
.26891	.0491	.73109	.31834	.0542	.68166	.38775	.0593	.61225
.26978	.0492	.73022	.31944	.0543	.68056	.38954	.0594	.61046
.27065	.0493	.72935	.32055	.0544	.67945	.39137	.0595	.60863
.27152	.0494	.72848	.32167	.0545	.67833	.39322	.0596	.60678
.27240	.0495	.72760	.32279	.0546	.67721	.39511	.0597	.60489
.27328	.0496	.72672	.32393	.0547	.67607	.39704	.0598	.60296
.27416	.0497	.72584	.32507	.0548	.67493	.39900	.0599	.60100
.27505	.0498	.72495	.32621	.0549	.67379	.40100	.0600	.59900
.27594	.0499	.72406	.32737	.0550	.67263	.40304	.0601	.59696
.27684	.0500	.72316	.32853	.0551	.67147	.40513	.0602	.59487
.27773	.0501	.72227	.32970	.0552	.67030	.40726	.0603	.59274
.27864	.0502	.72136	.33088	.0553	.66912	.40944	.0604	.59056
.27954	.0503	.72046	.33207	.0554	.66793	.41168	.0605	.58832
.28045	.0504	.71955	.33326	.0555	.66674	.41397	.0606	.58603
.28136	.0505	.71864	.33447	.0556	.66553	.41633	.0607	.58367
.28228	.0506	.71772	.33568	.0557	.66432	.41875	.0608	.58125
.28320	.0507	.71680	.33690	.0558	.66310	.42125	.0609	.57875
.28412	.0508	.71588	.33813	.0559	.66187	.42384	.0610	.57616
.28505	.0509	.71495	.33937	.0560	.66063	.42651	.0611	.57349
.28599	.0510	.71401	.34062	.0561	.65938	.42928	.0612	.57072
.28692	.0511	.71308	.34188	.0562	.65812	.43217	.0613	.56783
.28786	.0512	.71214	.34315	.0563	.65685	.43519	.0614	.56481
.28881	.0513	.71119	.34443	.0564	.65557	.43835	.0615	.56165
.28976	.0514	.71024	.34572	.0565	.65428	.44169	.0616	.55831
.29071	.0515	.70929	.34702	.0566	.65298	.44522	.0617	.55478
.29167	.0516	.70833	.34834	.0567	.65166	.44900	.0618	.55100
.29263	.0517	.70737	.34966	.0568	.65034	.45309	.0619	.54691
.29360	.0518	.70640	.35100	.0569	.64900	.45757	.0620	.54243
.29457	.0519	.70543	.35235	.0570	.64765	.46258	.0621	.53742
.29554	.0520	.70446	.35371	.0571	.64629	.46837	.0622	.53163
.29653	.0521	.70347	.35508	.0572	.64492	.47550	.0623	.52450
.29751	.0522	.70249	.35647	.0573	.64353	.48585	.0624	.51415
0.29850	0.0523	0.70150	0.35787	0.0574	0.64213	0.50000	0.0625	0.50000

In critical cases ascend.

$$f_n = f_0 + {}^{11}\Delta' + B''(\Delta_0'' + \Delta_1'') + B''' \Delta''' + B^{(4)}(\Delta_0^{(4)} + \Delta_1^{(4)})$$

BESSELIAN COEFFICIENT OF THE DOUBLE SECOND DIFFERENCE

The coefficient is always negative.

<i>n</i>	<i>B''</i>	<i>n</i>	<i>n</i>	<i>B''</i>	<i>n</i>	<i>n</i>	<i>B''</i>	<i>n</i>
0.0000	—	1.0000	0.0901	—	0.9099	0.2101	—	0.7899
.0020	0.000	0.9980	.0950	0.021	.9050	.2171	0.042	.7829
.0060	.001	.9940	.1000	.022	.9000	.2243	.043	.7757
.0101	.002	.9899	.1050	.023	.8950	.2316	.044	.7684
.0142	.003	.9858	.1101	.024	.8899	.2392	.045	.7608
.0183	.004	.9817	.1152	.025	.8848	.2470	.046	.7530
.0225	.005	.9775	.1205	.026	.8795	.2550	.047	.7450
.0267	.006	.9733	.1258	.027	.8742	.2633	.048	.7367
.0309	.007	.9691	.1312	.028	.8688	.2719	.049	.7281
.0352	.008	.9648	.1366	.029	.8634	.2809	.050	.7191
.0395	.009	.9605	.1422	.030	.8578	.2902	.051	.7098
.0439	.010	.9561	.1478	.031	.8522	.3000	.052	.7000
.0483	.011	.9517	.1535	.032	.8465	.3102	.053	.6898
.0527	.012	.9473	.1594	.033	.8406	.3211	.054	.6789
.0572	.013	.9428	.1653	.034	.8347	.3326	.055	.6674
.0618	.014	.9382	.1713	.035	.8287	.3450	.056	.6550
.0664	.015	.9336	.1775	.036	.8225	.3585	.057	.6415
.0710	.016	.9290	.1837	.037	.8163	.3735	.058	.6265
.0757	.017	.9243	.1901	.038	.8099	.3904	.059	.6096
.0804	.018	.9196	.1966	.039	.8034	.4105	.060	.5895
.0852	.019	.9148	.2033	.040	.7967	.4367	.061	.5633
0.0901	0.020	0.9099	0.2101	0.041	0.7899	0.5000	0.062	0.5000

In critical cases ascend.

Notation :

f_{-1}	Δ'_1	Δ''_1	Δ'''_1
f_0	Δ'_0	Δ''_0	Δ'''_0
f_1	Δ'_1	Δ''_1	Δ'''_1
f_2	Δ'_2	Δ''_2	Δ'''_2

Note that $\Delta''_0 + \Delta'_1 = \Delta'_1 - \Delta'_2$
 $\Delta'''_0 + \Delta''_1 = \Delta''_1 - \Delta''_2$

Formula :

$$f_n = f_0 + n\Delta'_1 + B''(\Delta''_0 + \Delta''_1) + B''' \Delta'''_1 + B^{(4)}(\Delta^{(4)}_0 + \Delta^{(4)}_1)$$

$$\text{or } f_n = f_0 + n\Delta'_1 + E''_0\Delta''_0 + E''_1\Delta''_1 + B^{(4)}(\Delta^{(4)}_0 + \Delta^{(4)}_1)$$

$$\text{or } f_n = L_{-1}f_{-1} + L_0f_0 + L_1f_1 + L_2f_2 + B^{(4)}(\Delta^{(4)}_0 + \Delta^{(4)}_1)$$

If the fourth difference is negligible, i.e. less than 20, the last term can be omitted in each case.

For $n = \frac{1}{2}$, with fourth differences negligible,

$$f_{\frac{1}{2}} = \frac{1}{18}(-f_{-1} + 9f_0 + 9f_1 - f_2)$$

or, if fourth differences are not negligible,

$$f_{\frac{1}{2}} = \frac{1}{18}(3f_{-1} - 25f_{-1} + 150f_0 + 150f_1 - 25f_2 + 3f_3)$$

For further explanation see page 851.

TABLE XIX
INTERPOLATION TABLES

n	$L_{-1}=E_0''$	L_0	L_1	$L_2=E_1''$		n	B''	n
	-	+	+	-				
0.00	0.00000	1.00000	0.00000	0.00000	1.00	0.0000	0.000	1.0000
.01	.00328 ³²⁸	0.99490 ⁵¹⁰	.01005 ¹⁰⁰⁵	.00167 ¹⁶⁷	0.99	.0061	0.000	0.9939
.02	.00647 ³¹⁹	.98960 ⁵³⁰	.02020 ¹⁰¹⁵	.00333 ¹⁶⁶	.98	.0190	+0.01-	.9810
.03	.00955 ³⁰⁸	.98411 ⁵⁴⁹	.03044 ¹⁰²⁴	.00500 ¹⁶⁷	.97	.0332	+0.02-	.9668
.04	.01254 ²⁹⁹	.97843 ⁵⁶⁸	.04077 ¹⁰³³	.00666 ¹⁶⁶	.96	.0489	+0.03-	.9511
	.290	.587	.1042	.165		.0667	+0.04-	.9333
0.05	0.01544 ²⁸⁰	0.97256 ⁶⁰⁵	0.05119 ¹⁰⁵⁰	0.00831 ¹⁶⁵	0.95	.0877	+0.05-	.9123
.06	.01824 ²⁷⁰	.96651 ⁶²⁴	.06169 ¹⁰⁵⁹	.00996 ¹⁶⁵	.94	.1140	+0.06-	.8860
.07	.02094 ²⁶¹	.96027 ⁶⁴¹	.07228 ¹⁰⁶⁶	.01161 ¹⁶⁴	.93	.1532	+0.07-	.8468
.08	.02355 ²⁵²	.95386 ⁶⁶⁰	.08294 ¹⁰⁷⁵	.01325 ¹⁶³	.92	.2735	+0.08-	.7265
.09	.02607 ²⁴³	.94726 ⁶⁷⁶	.09369 ¹⁰⁸¹	.01488 ¹⁶²	.91	.3210	+0.09-	.6790
0.10	0.02850	0.94050 ⁶⁹³	0.10450 ¹⁰⁸⁸	0.01650 ¹⁶¹	0.90	.3560	+0.10-	.6440
.11	.03084 ²³⁴	.93357 ⁷¹¹	.11538 ¹⁰⁹⁶	.01811 ¹⁶⁰	.89	.3860	+0.11-	.6140
.12	.03309 ²²⁵	.92646 ⁷²⁶	.12634 ¹¹⁰¹	.01971 ¹⁵⁹	.88	.4134	+0.12-	.5866
.13	.03525 ²¹⁶	.91920 ⁷⁴³	.13735 ¹¹⁰⁸	.02130 ¹⁵⁸	.87	.4390	+0.13-	.5610
.14	.03732 ²⁰⁷	.91177 ⁷⁵⁸	.14843 ¹¹¹³	.02288 ¹⁵⁶	.86	.4638	+0.14-	.5362
0.15	0.03931	0.90419 ⁷⁷⁴	0.15956 ¹¹¹⁹	0.02444 ¹⁵⁴	0.85	.4879	+0.15-	.5121
.16	.04122 ¹⁸²	.89645 ⁷⁸⁹	.17075 ¹¹²⁴	.02598 ¹⁵³	.84	0.5000	0.000	0.5000
.17	.04304 ¹⁷³	.88856 ⁸⁰⁴	.18199 ¹¹²⁹	.02751 ¹⁵²	.83	<i>In critical cases ascend.</i>		
.18	.04477 ¹⁶⁶	.88052 ⁸¹⁹	.19328 ¹¹³⁴	.02903 ¹⁴⁹	.82			
.19	.04643 ¹⁵⁷	.87233 ⁸³³	.20462 ¹¹³⁸	.03052 ¹⁴⁸	.81			
0.20	0.04800	0.86400 ⁸⁴⁷	0.21600 ¹¹⁴²	0.03200 ¹⁴⁶	0.80			
.21	.04949 ¹⁴⁹	.85553 ⁸⁶¹	.22742 ¹¹⁴⁶	.03346 ¹⁴³	.79	n	B''	n
.22	.05091 ¹⁴³	.84692 ⁸⁷⁴	.23888 ¹¹⁴⁹	.03489 ¹⁴²	.78			
.23	.05224 ¹³³	.83818 ⁸⁸⁷	.25037 ¹¹⁵²	.03631 ¹³⁹	.77			
.24	.05350 ¹¹⁹	.82931 ⁹⁰⁰	.26189 ¹¹⁵⁵	.03770 ¹³⁶	.76			
0.25	0.05469 ¹¹¹	0.82031 ⁹¹²	0.27344 ¹¹⁵⁷	0.03906 ¹³⁴	0.75			
.26	.05580 ¹⁰³	.81119 ⁹²⁵	.28501 ¹¹⁶⁰	.04040 ¹³²	.74	0.0000	+	1.0000
.27	.05683 ⁹⁶	.80194 ⁹³⁶	.29661 ¹¹⁶¹	.04172 ¹²⁹	.73	.0120	0.000	0.9880
.28	.05779 ⁸⁹	.79258 ⁹⁴⁹	.30822 ¹¹⁶⁴	.04301 ¹²⁶	.72	.0367	.001	.9633
.29	.05868 ⁸²	.78309 ⁹⁵⁹	.31986 ¹¹⁶⁴	.04427 ¹²³	.71	.0621	.002	.9379
0.30	0.05950	0.77350 ⁹⁷⁰	0.33150 ¹¹⁶⁵	0.04550 ¹²⁰	0.70	.0885	.003	.9115
.31	.06025 ⁶⁸	.76380 ⁹⁸²	.34315 ¹¹⁶⁷	.04670 ¹¹⁷	.69	.1162	.004	.8838
.32	.06093 ⁶¹	.75398 ⁹⁹¹	.35482 ¹¹⁶⁶	.04787 ¹¹⁴	.68	.1454	.005	.8546
.33	.06154 ⁵⁴	.74407 ¹⁰⁰²	.36648 ¹¹⁶⁷	.04901 ¹¹¹	.67	.1766	.006	.8234
.34	.06208 ⁴⁸	.73405 ¹⁰¹¹	.37815 ¹¹⁶⁶	.05012 ¹⁰⁷	.66	.2105	.007	.7895
0.35	0.06256	0.72394 ¹⁰²¹	0.38981 ¹¹⁶⁶	0.05119 ¹⁰³	.65	.2481	.008	.7519
.36	.06298 ⁴²	.71373 ¹⁰³⁰	.40147 ¹¹⁶⁵	.05222 ¹⁰⁰	.64	.2917	.009	.7083
.37	.06333 ³⁵	.70343 ¹⁰³⁹	.41312 ¹¹⁶⁴	.05322 ⁹⁷	.63	.3463	.010	.6537
.38	.06361 ²⁸	.69304 ¹⁰⁴⁸	.42476 ¹¹⁶³	.05419 ⁹²	.62	.4351	.011	.5649
.39	.06384 ¹⁶	.68256 ¹⁰⁵⁶	.43639 ¹¹⁶¹	.05511 ⁸⁹	.61	0.5000	0.012	0.5000
0.40	0.06400	0.67200 ¹⁰⁶⁴	0.44800 ¹¹⁵⁹	0.05600 ⁸⁵	0.60	<i>In critical cases ascend.</i>		
.41	.06410 ⁵	.66136 ¹⁰⁷²	.45959 ¹¹⁵⁷	.05685 ⁸⁰	.59			
.42	.06415 ²	.65064 ¹⁰⁷⁹	.47116 ¹¹⁵⁴	.05765 ⁷⁷	.58			
.43	.06413 ⁷	.63985 ¹⁰⁸⁶	.48270 ¹¹⁵¹	.05842 ⁷²	.57			
.44	.06406 ¹²	.62899 ¹⁰⁹³	.49421 ¹¹⁴⁸	.05914 ⁶⁷	.56			
0.45	0.06394	0.61806 ¹⁰⁹⁹	0.50569 ¹¹⁴⁴	0.05981 ⁶³	0.55			
.46	.06376 ²⁴	.60707 ¹¹⁰⁶	.51713 ¹¹⁴¹	.06044 ⁵⁹	.54			
.47	.06352 ²⁹	.59601 ¹¹¹¹	.52854 ¹¹³⁶	.06103 ⁵⁴	.53			
.48	.06323 ³⁴	.58490 ¹¹¹⁸	.53990 ¹¹³³	.06157 ⁴⁹	.52			
.49	.06289 ³⁹	.57372 ¹¹²²	.55123 ¹¹²⁷	.06206 ⁴⁴	.51			
0.50	0.06250	0.56250 ⁺	0.56250 ⁺	0.06250 ⁻	0.50			
	-	+	+	-				
	$L_2=E_1''$	L_1	L_0	$L_{-1}=E_0''$	n			

Note that E_0'' and E'' are always negative; and that B'' is always positive.

For formulæ of application see foot of previous page.

EVERETT COEFFICIENTS OF THE SECOND DIFFERENCE

The coefficients are always negative.

n for E_0''	E''	n for E_1''	n for E_0''	E''	n for E_1''	n for E_0''	E''	fo
0.0000	—	1.0000	0.1670	—	0.8330	0.7239	—	0.
.0015	0.000	0.9985	.1726	0.043	.8274	.7316	0.042	.
.0045	.001	.9955	.1784	.044	.8216	.7392	.041	.
.0075	.002	.9925	.1843	.045	.8157	.7467	.040	.
.0106	.003	.9894	.1904	.046	.8096	.7541	.039	.
.0137	.004	.9863	.1967	.047	.8033	.7614	.038	.
.0169	.005	.9831	.2032	.048	.7968	.7686	.037	.
.0201	.006	.9799	.2100	.049	.7900	.7757	.036	.
.0233	.007	.9767	.2170	.050	.7830	.7827	.035	.
.0265	.008	.9735	.2243	.051	.7757	.7896	.034	.
.0298	.009	.9702	.2319	.052	.7681	.7965	.033	.
.0331	.010	.9669	.2399	.053	.7601	.8034	.032	.
.0364	.011	.9636	.2483	.054	.7517	.8101	.031	.
.0398	.012	.9602	.2572	.055	.7428	.8168	.030	.
.0432	.013	.9568	.2667	.056	.7333	.8235	.029	.
.0467	.014	.9533	.2768	.057	.7232	.8300	.028	.
.0502	.015	.9498	.2878	.058	.7122	.8366	.027	.
.0537	.016	.9463	.3000	.059	.7000	.8431	.026	.
.0573	.017	.9427	.3135	.060	.6865	.8495	.025	.
.0609	.018	.9391	.3293	.061	.6707	.8560	.024	.
.0646	.019	.9354	.3486	.062	.6514	.8623	.023	.
.0683	.020	.9317	.3758	.063	.6242	.8687	.022	.
.0721	.021	.9279	.4707	.064	.5293	.8750	.021	.
.0759	.022	.9241	.5000	.065	.5000	.8813	.020	.
.0797	.023	.9203	.5213	.066	.4787	.8875	.019	.
.0837	.024	.9163	.5390	.067	.4610	.8938	.018	.
.0877	.025	.9123	.5547	.069	.4453	.9000	.017	.
.0917	.026	.9083	.5688	.059	.4312	.9061	.016	.
.0958	.027	.9042	.5819	.058	.4181	.9123	.015	.
.1000	.028	.9000	.5941	.057	.4059	.9184	.014	.
.1042	.029	.8958	.6056	.056	.3944	.9245	.013	.
.1085	.030	.8915	.6166	.055	.3834	.9306	.012	.
.1129	.031	.8871	.6271	.054	.3729	.9367	.011	.
.1173	.032	.8827	.6372	.053	.3628	.9428	.010	.
.1218	.033	.8782	.6470	.052	.3530	.9488	.009	.
.1264	.034	.8736	.6564	.051	.3436	.9549	.008	.
.1311	.035	.8689	.6656	.050	.3344	.9609	.007	.
.1359	.036	.8641	.6745	.049	.3255	.9669	.006	.
.1408	.037	.8592	.6832	.048	.3168	.9729	.005	.
.1458	.038	.8542	.6916	.047	.3084	.9789	.004	.
.1509	.039	.8491	.7000	.046	.3000	.9849	.003	.
.1561	.040	.8439	.7081	.045	.2919	.9909	.002	.
.1615	.041	.8385	.7161	.044	.2839	0.9969	.001	.
0.1670	0.042	0.8330	0.7239	0.043	0.2761	1.0000	0.000	0.c

In critical cases ascend.

$$f_n = f_0 + n\Delta' + E_0''\Delta_0'' + E_1''\Delta_1'' + B''(\Delta_0'' + \Delta_1'')$$

THROW-BACK FROM FOURTH TO SECOND DIFFERENCES

If the argument is Δ'' , the tabular entry is the amount to be applied to Δ' , with opposite sign to Δ'' .

If the argument is $\Delta_0'' + \Delta_1''$, the tabular entry is to be applied to $\Delta_0' + \Delta_1'$, with opposite sign to $\Delta_0'' + \Delta_1''$.

0	0	144	27	290	54	437	81	584	108	730	135	877	162
2	1	149	28	296	55	442	82	589	109	736	136	883	163
8	2	154	29	301	56	448	83	595	110	741	137	888	164
13	3	160	30	307	57	453	84	600	111	747	138	894	165
19	4	165	31	312	58	459	85	605	112	752	139	899	166
24	5	171	32	317	59	464	86	611	113	758	140	904	167
29	6	176	33	323	60	470	87	616	114	763	141	910	168
35	7	182	34	328	61	475	88	622	115	769	142	915	169
40	8	187	35	334	62	480	89	627	116	774	143	921	170
46	9	192	36	339	63	486	90	633	117	779	144	926	171
51	10	198	37	345	64	491	91	638	118	785	145	932	172
57	11	203	38	350	65	497	92	644	119	790	146	937	173
62	12	209	39	355	66	502	93	649	120	796	147	942	174
67	13	214	40	361	67	508	94	654	121	801	148	948	175
73	14	220	41	366	68	513	95	660	122	807	149	953	176
78	15	225	42	372	69	519	96	665	123	812	150	959	177
84	16	230	43	377	70	524	97	671	124	817	151	964	178
89	17	236	44	383	71	529	98	676	125	823	152	970	179
95	18	241	45	388	72	535	99	682	126	828	153	975	180
100	19	247	46	394	73	540	100	687	127	834	154	980	181
105	20	252	47	399	74	546	101	692	128	839	155	986	182
111	21	258	48	404	75	551	102	698	129	845	156	991	183
116	22	263	49	410	76	557	103	703	130	850	157	997	184
122	23	269	50	415	77	562	104	709	131	855	158	1002	185
127	24	274	51	421	78	567	105	714	132	861	159	1008	186
133	25	279	52	426	79	573	106	720	133	866	160	1013	187
138	26	285	53	432	80	578	107	725	134	872	161	1019	188
144		290		437		584		730		877		1024	

In critical cases ascend.

The effect of fourth differences may be taken into consideration by using $M'' = \Delta'' - 0.184 \Delta'''$ in Bessel's or Everett's formula instead of Δ'' . The above table gives $0.184 \Delta'''$. The method should not be used if the fourth difference exceeds 1000. For further explanation see page 852.

$$\begin{aligned}
 f_n &= f_0 + n\Delta' + B''(M_0'' + M_1'') + B''' \Delta''' \\
 \text{or } f_n &= f_0 + n\Delta' + E_0'' M_0'' + E_1'' M_1'' \\
 &= (1 - n) f_0 + n f_1 + E_0'' M_0'' + E_1'' M_1''
 \end{aligned}$$

750 ASTRONOMICAL SYMBOLS AND ABBREVIATI

SUN, MOON, PLANETS, ETC.

☉ The Sun	⊕ The Earth	♅ Uranus
☾ The Moon	♂ Mars	♆ Neptune
☿ Mercury	♃ Jupiter	♁ Comet
♀ Venus	♄ Saturn	★ Star
①, ②, ③, etc., Minor planets		

SIGNS OF THE ZODIAC

♈ Aries 0°	♌ Leo 120°	♐ Sagittarius 24°
♉ Taurus 30	♍ Virgo 150	♑ Capricornus 27
♊ Gemini 60	♎ Libra 180	♒ Aquarius 30
♋ Cancer 90	♏ Scorpio 210	♓ Pisces 33

ASPECTS

- ♌ Conjunction, or having the same longitude or right ascension
 □ Quadrature, or differing by 90° in longitude or right ascension
 ♌ Opposition, or differing by 180° in longitude or right ascension

SYMBOLS

- ♌ Ascending node ♎ Descending node
 + Symbol of northern latitude or declination, or of westerly longitude or hour angle
 - Symbol of southern latitude or declination, or of easterly longitude or hour angle

ABBREVIATIONS

- N. North ^d Days ° Degrees
 S. South ^h Hours ' Minutes of arc
 E. East ^m Minutes of time " Seconds of arc
 W. West ^s Seconds of time

See also Contractions, page 751.

GREEK ALPHABET

A α Alpha	I ι Iota	P ρ Rho
B β Beta	K κ Kappa	Σ σ Sigma
Γ γ Gamma	Λ λ Lambda	T τ Tau
Δ δ Delta	M μ Mu	Υ υ Upsilon
E ε Epsilon	N ν Nu	Φ φ Phi
Z ζ Zeta	Ξ ξ Xi	Χ χ Chi
H η Eta	Ο ο Omicron	Ψ ψ Psi
Θ θ Theta	Π π Pi	Ω ω Omega

ω An alternative form for Pi

A.N.	Almanaque Nautico (San Fernando)
A.E.	American Ephemeris and Nautical Almanac (Washington)
A.G.	Astronomische Gesellschaft
B.J.	Berliner Jahrbuch (Berlin)
B.	Bode's Catalogue (1801)
B.D.	Bonn Durchmusterung
B.A.C.	British Association Catalogue
C.P.D.	Cape Photographic Durchmusterung
C.T.	Connaissance des Temps (Paris)
C.D.	Cordoba Durchmusterung
Dec.	Declination
E.B.L.	Eigenbewegungs Lexikon (Schorr)
G.F.H.	Geschichte des Fixsternhimmels
G.	Gould's <i>Uranometria Argentina</i>
G.C.T.	Greenwich civil time*
G.M.T.	Greenwich mean time*
G.M.A.T.	Greenwich mean astronomical time*
H'.	Heis's <i>Catalogus Stellarum</i>
H.D.	Henry Draper Catalogue
H.	Hevelius's Catalogue (1660)
H.P.	Horizontal parallax
I.A.U.	International Astronomical Union
J.D.	Julian Day
M.	Messier's Catalogue of Nebulæ
N.A.	Nautical Almanac and Astronomical Ephemeris (London)
N.G.C.	New General Catalogue of Nebulæ, <i>Memoirs of R.A.S.</i> , 49
N.P.D.	North polar distance = $90^\circ - \delta$
P.A.	Position angle
P.M.	Proper motion
R.A.	Right ascension
S.D.	Semi-diameter
U.T.	Universal time*
W.Z.C.	Washington Zodiacal Catalogue
W.B.	Weisse's Bessel
Z.D.	Zenith distance

* See page 772.

NOTATION

Throughout the NAUTICAL ALMANAC Roman letters are used for contractions, e.g. R.A. for right ascension, and italic letters for symbols, e.g. *P* for position angle.

In the following lists a few symbols not actually occurring in the NAUTICAL ALMANAC, but well established in spherical and dynamical astronomy, are included; those used for a temporary or special purpose are not included here, but are defined as they occur.

ITALIC ALPHABET

<i>A, B, C, D, E</i>	Besselian day numbers
<i>A, B, C, a, b, c</i>	Gaussian constants of an orbit
<i>a, b, c</i>	Quantities for reduction for precession
<i>a, b, c, d</i>	Besselian star constants
<i>A</i>	Azimuth
<i>a</i>	Semi-major axis of an orbit; equatorial radius of the earth
<i>b</i>	Heliocentric latitude; semi-minor axis of an orbit; polar radius of the earth
<i>d</i>	Symbol of differentiation
<i>E</i>	Eccentric anomaly
<i>e</i>	Eccentricity; base of natural logarithms = 2.7182818285...
<i>f, g, G, h, H, i</i>	Independent day numbers
<i>f, F</i>	Symbol of a function
<i>G</i>	Galactic longitude
<i>g</i>	Intensity of gravity; sometimes used for mean anomaly (see also <i>M</i>); galactic latitude
<i>H</i>	Altitude above the horizon
<i>h</i>	Hour angle
<i>i</i>	Inclination to plane of ecliptic
<i>k</i>	Gaussian gravitation constant; constant of aberration; ratio of the Moon's diameter to Earth's equatorial diameter; coefficient of refraction
<i>L</i>	Mean longitude = $\Omega + \omega + M$; see also \odot and \oslash
<i>l</i>	Heliocentric longitude
<i>M</i>	Mean anomaly (see also <i>g</i>); modulus of common logarithms
<i>m</i>	Annual precession in R.A.; mass
<i>n</i>	Annual precession in declination; sometimes used for mean daily motion (see also μ)
<i>P</i>	Position angle, measured from the north towards the east; period of a planet or comet
<i>p</i>	General precession in longitude
<i>q</i>	Perihelion distance; parallactic angle
<i>R</i>	Radius vector of the Sun (or Earth)
<i>r</i>	Radius vector, expressed in astronomical units
<i>T</i>	Time expressed in units of a century; time of perihelion passage
<i>t</i>	Time expressed in years or smaller units
<i>u</i>	Argument of latitude = $\omega + v$
<i>v</i>	True anomaly or angle from perihelion
<i>X, Y, Z</i>	Geocentric equatorial rectangular co-ordinates of the Sun
<i>x, y, z</i>	Heliocentric equatorial rectangular co-ordinates
<i>z</i>	Zenith distance

GREEK ALPHABET

α	Right ascension
β	Geocentric latitude
Γ	Mean longitude of perigee
Δ	Difference; symbol of increment; geocentric distance
δ	Declination
ϵ	Obliquity of the ecliptic
θ	Sometimes (but not in <i>N.A.</i>) used for longitude of ascending node (see also Ω)
λ	Geocentric longitude; planetary precession on the equator
μ	Mean daily motion; proper motion
ξ, η, ζ	Geocentric rectangular equatorial co-ordinates
π	Ratio of circumference to diameter; parallax; used by Newcomb for mean longitude of perigee
$\tilde{\omega}$	Longitude of perihelion = $\Omega + \omega$
ρ	Distance from centre of earth in units of earth's equatorial radius
Σ	Symbol of summation
τ	Fraction of the year since the commencement of the Besselian fictitious year
ϕ	Geographical latitude; eccentric angle of an orbit ($\sin \phi = e$)
ϕ'	Geocentric latitude
ψ	Luni-solar precession in longitude
ω	Arc from node to perihelion = $\tilde{\omega} - \Omega$

SYMBOLS

\odot	Mean longitude of the Sun
\lrcorner	Mean longitude of the Moon
Ω	Longitude of ascending node
Υ	First point of Aries
+	Symbol of northern latitude or declination, and of westerly longitude and hour angle
-	Symbol of southern latitude or declination, and of easterly longitude and hour angle
[]	Symbol of summation; also used to enclose a factor given as a logarithm

EXPLANATION

THE CALENDAR

A calendar is a method of combining days into periods adapted to the purposes of civil life and religious observances, or to the requirements of scientific precision, such as weeks, months and years. Three of the periods used in calendars, namely days, months and years, are based on those astronomical periods that have the greatest importance for the conditions of human life. Other measures of time, such as the week and the subdivisions of the day, are artificial.

The complexity of calendars is due mainly to the incommensurability of the astronomical periods on which they are based. The supply of light by the two great luminaries is governed by the periods known to astronomers as the solar day and the synodic month, while the return of the seasons depends on the tropical year. The length of the synodic month at the present time (1935) is 29·5305879 days, while that of the tropical year is 365·24219 days, each period being subject to an uncertainty of about one unit in the last figure given. Both periods are slowly decreasing, the synodic month or lunation by about three and a half units in the last figure every century, and the year by about one and a third units in the last figure every century.* From the lengths of these two periods we find that the number of lunations in a tropical year is 12·3682668, decreasing by about three units in the last figure every century. The changes in the lengths of these periods are of little importance in the study of calendars.

Egyptian Calendar.—The Egyptian year from an extremely remote date consisted of 12 months of 30 days each, followed by 5 days called in Greek *ἐπαγόμεναι* or “added”, making 365 days altogether. The 30-day period is obviously based on the lunation, so that the calendar must at some date have been governed by the Moon, while its primitive connection with the solar year is proved by its division into three seasons—Flood time, Seed time, Harvest time—each containing four months, which in hieroglyphics are always designated by their place in the season to which they were supposed to belong. But before the earliest times known to us, all attempt to equate the calendar month to the phases of the Moon or the calendar seasons to the natural seasons had been abandoned, and the beginning of the Egyptian year and of the calendar seasons gradually retrograded, returning to its place in the tropical year in 1505 tropical or 1506 Egyptian years. The Egyptians, however, used to check the relation of the calendar to the natural year, not by the solstices and equinoxes, but by the heliacal rising of Sirius, which, according to Herr Schoch’s determination,† returned in the latitude of Memphis at a mean interval of 365·2507 days. The Egyptians, taking the length of the natural year as 365·25 days, formed a cycle of 1461 calendar years which they equated to 1460 natural years, and which was known by the name of the Sothic or dog-star cycle. In the absence of an accurate historical chronology and of a continuous record of years a cycle of this length had a purely theoretical importance.

The Egyptian calendar was, up to the time of Julius Cæsar’s reform of the Roman calendar in 46 B.C., the only civil calendar in which the length of each month and of each year was fixed by rule, instead of being determined by the discretion of

* See the figures in Schoch’s *Neubearbeitung der Syzygientafeln von Oppolzer*, Mitteilungen des Astronomischen Recheninstituts Berlin-Dahlem, Band 2, Nr. 2 (1928), II. Other recent determinations are in close agreement with Schoch’s.

† *Die Länge der Sothisperioden beträgt 1456 Jahre*, Selbstverlag, Berlin-Steglitz, 1928.

officials or by direct observation. If the number of years between two astronomical observations, dated by the Egyptian calendar, was known, the exact number of days could be determined by a simple calculation. No such comparison could be made between dates referred to any other civil calendar unless the computer had access to a record showing the number of days that had actually been assigned to each month and the number of months that had actually been assigned to each year. It is true that the Egyptians did not use a continuous era, but were content to number the years of each reign separately, so that there was a difficulty in identifying a particular year, but the astronomers of the Ptolemaic age rectified this by the introduction of eras. The simplicity and regularity of the Egyptian calendar commended it to astronomers, who found it excellently adapted to the construction of tables that could be readily applied and used even for a remote past or for a distant future without any fear that the system by which time was reckoned in the tables might not coincide with the system in actual use. In the second century B.C. we find Chaldean observations, sometimes nearly six centuries old, reduced to the Egyptian calendar in the works of Hipparchus, who observed not in Egypt but at Rhodes, and cited from him by the Egyptian Ptolemy in the second century of our era; we also find in the second century B.C. an Athenian observation of 432 B.C. reduced to the Egyptian calendar on an inscription found at Miletus, which appears to represent the work of the astronomer Epigenes.

Each Egyptian month had its proper festival. These festivals were finally fixed about 1200 B.C., and in Aramaic and Greek texts from the fifth century B.C. onwards the Egyptian months bear names based on the monthly festivals.

An attempt by Ptolemy Euergetes in 238 B.C. to introduce a sixth *ἐταγομένη* once in four years failed, but a renewed attempt under Augustus (26–23 B.C.) was more successful. An additional day was inserted at the close of the Egyptian year 23–22 B.C. on August 29 of what we call the Julian calendar, and at the close of every fourth year afterwards, so that the reformed or Alexandrian year began on August 30 of the Julian calendar in the year preceding a Julian leap year and on August 29 in all other years. The effect of this reform was to keep each Egyptian month fixed to the place in the natural year which it happened to occupy under the old calendar in the years 26–22 B.C. But the old calendar was not easily suppressed, and we find the two used side by side till A.D. 238 at least. The old calendar was probably the more popular, and was preferred by astronomers and astrologers. Ptolemy always used it, except in his treatise on annual phenomena, for which the new calendar was obviously more convenient. Theon in the fourth century A.D., though mentioning the old calendar, habitually used the new.

The old Egyptian calendar was adopted by the Persians, perhaps about 500 B.C., in a form that cannot now be accurately restored, and survives in a slightly modified form in the Armenian calendar, the three first months of the old Egyptian year corresponding exactly with the three last months of the Armenian year. These are followed in the Armenian calendar by the five additional days, so that for the remainder of the year the Armenian months begin five days later than those of the old Egyptian calendar. The Alexandrian calendar is still the calendar of Abyssinia and of the Coptic church, and is used for agricultural purposes in Egypt and other parts of northern Africa.

Babylonian Calendar.—The main principles of the Babylonian calendar became fixed in the latter half of the third millennium before Christ. The year began in the spring with the month *Nisanu*. It contained ordinarily twelve months, the beginnings of which were fixed by observation of the lunar crescent. In this calendar,

as in all lunar calendars except the Mohammedan, one of the months was repeated when necessary, in order to keep each month fixed to a definite season in the year. At Babylon the month so repeated was most commonly the last month *Addaru*, but not infrequently the sixth month *Ululu*, and very occasionally some other month. The intercalary month was inserted at very irregular intervals, the known intervals between one intercalation and the next varying from six months to six years. It would appear that from the accession of Nabonassar in 747 B.C. a record was kept of the observations in each month and of the number of days that were assigned to each month. This made it possible to define the exact interval between observations and provided the means for a precise determination of astronomical periods, especially those which affected the times and magnitudes of lunar eclipses. The oldest precise determination of which we have any knowledge was the eclipse period or *saros* in which 223 lunations were taken as equal to $6585\frac{1}{4}$ days. The correct astronomical length of 223 lunations was 6585.323 days, so that the error would amount to one day in about 1800 years. This period must have been known early in the sixth century B.C. The saros is independent of the length of the tropical year, but Geminus and Ptolemy state that the motion of the Sun in longitude in the saros period was taken as equal to 18 revolutions plus $10\frac{3}{4}^\circ$. The correct time for the Sun's longitude to increase by this amount was 6585.19 days, so that the assumed length of the natural year involved an error of about 0.14 day in 18 years.

From 529 to 504 B.C. an octaeteris or 8-year cycle was in use at Babylon. In this the length of each month was still determined by observation of the crescent, but the intercalary months occupied fixed places in the cycle and each cycle of 8 years was made to contain 99 months. The effect of this was to make the mean length of eight years amount to 2923.53 days as compared with a correct duration of 2921.94 days and the received value of 2922 days. It is not surprising that this cycle was soon laid aside and arbitrary intercalation resumed. If we may accept Schnabel's dates* for Naburianos and Cidenas there was a steady improvement in the determination of astronomical constants in the next age. Naburianos about 500 B.C. found for the synodic month a length of 29.530614 days as compared with the correct value of 29.530596 days, and for the year 365.2609 days as compared with the correct value of 365.2425 days for the tropical year. But since the length of the year was derived from the inequalities that it produced in the length of the month, it would be more correct to compare it with the anomalistic year, which had a duration of 365.2598 days. Cidenas about 383 B.C. determined the length of the synodic month as 29.530594 days. He also determined the length of the tropical year as 365.236 days. In 383 B.C. a 19-year cycle of intercalations was introduced at Babylon, which continued in use as long as a Babylonian calendar can be traced. This provided for 7 intercalary months occupying fixed places in each cycle of 19 years, so that 19 years were equated to 235 lunations. The beginning of each month continued to be determined by observation of the lunar crescent. An astronomical 19-year cycle had, as will be seen, been published by Meton at Athens in 432 B.C. The effect of the Babylonian 19-year cycle is to make the mean year consist of 12.36842 lunations, and to make the mean calendar year consist of 365.2468 days, an excess of 0.0043 over the correct value.† Cidenas' value for the mean synodic month is retained in the modern Jewish calendar, as is the system of seven intercalations in 19 years, so that the Jewish calendar continues to imply a length of 365.2468 days for the year.

* *Zeitschrift für Assyriologie*, N.F., Band II (XXXVI) (1926), pp. 11, 16.

† For the Babylonian astronomical constants see Schnabel, *ubi supra*, and Fotheringham, *The Observatory*, LI (1928 October), pp. 301-315.

Greek Calendars.—All Greek calendars were lunar until the Roman period. Each community had a separate calendar. Bischoff has succeeded in putting together more or less complete lists of months in about a hundred Greek calendars.* There was great variety in the season when the year began in different calendars, but each month was kept roughly to one season of the year by the insertion of a thirteenth or intercalary month when required. In some calendars this was done by repeating the sixth month, in some by repeating the twelfth month; but in a few the intercalary month occupied other positions, and at Athens there are four instances preserved on inscriptions where an intercalation was made at an exceptional place in the year, and it is probable that the same happened elsewhere from time to time. Not only the intercalation of months, but also the regulation of the length of each month, appears to have been always in the hands of the public authorities, and if, as time advanced, they paid increasing respect to astronomical calendars, there is no evidence that any astronomical calendar ever acquired legal validity. The beginning of the Attic civil year is known to have fluctuated by 53 days as compared with the natural year during the Peloponnesian war.† We have less definite information as to the extent to which the beginning of the civil month was permitted to depart from the New Moon, but Aristophanes in *The Clouds*, acted in 423 B.C., makes the Moon complain that the days are not being kept correctly according to the Moon.

During the fifth century B.C. the Athenians had a senatorial or financial year, which was independent of the ordinary civil year and of the Moon. The council of 500 was divided into ten boards or prytanies, each of which functioned for the tenth part of the senatorial year. Meritt has shown that this year was a solar year of approximately 365½ days, beginning about July 6 of the Julian calendar, though the actual length could be varied at the discretion of the competent authorities. Inscriptions dealing with public accounts regularly date by the days of the different prytanies, though the year consisting of lunar months regulated the admission of magistrates, the celebration of festivals, and the proceedings of courts and assemblies. The financial year was, however, accommodated to the lunar calendar in or about 409 B.C.

The Macedonian calendar, which was of the Greek type, became current in western Asia as a result of Alexander's conquests, and even competed with the native calendar in Egypt. But in the Roman period the Greek calendars of Asia became purely solar calendars.

From the sixth century B.C. onwards the Greek astronomers, beginning with Cleostratus of Tenedos, framed a number of cycles, in which each month and year were given exact lengths dependent on their places in the cycle, and the attempt was made, so far as could be done without making the cycle too cumbrous, to maintain both for the mean month and for the mean year their correct astronomical values. It was an easy matter to compute the interval from one date to another in a calendar regulated by cycle, which was independent of the discretion of city governments. The original intention may have been merely to facilitate the determination of the age of the Moon and the season of the year, but the Metonic and Callippic cycles at least came to be used for dating astronomical observations.

The cycle invented by Cleostratus was an *octaeteris* or 8-year cycle and it probably dates from the time when an 8-year cycle was in use at Babylon. It made 8 years equal to 99 lunations and to 2922 days. As 99 lunations contain 2923·53 days, this

* Pauly-Wissowa, *Real-Encyclopädie*, X (1919), 1567-1602.

† See Meritt, *The Athenian Calendar* (Harvard University Press, 1928), and *Athenian Financial Documents of the Fifth Century* (University of Michigan Press, 1932).

form of the octaeteris would, if persisted in, have led rapidly to a large error in the tabular date of New Moon. Geminus records successive improvements in this calendar without mentioning their dates. The first was to add 3 days every 16 years, thus making 16 years equal to 198 lunations and to 5847 days. As 16 years should be 5843.88 days and 198 lunations should be 5847.06 days, the increased accuracy in the month was purchased at the expense of a large error in the year. Finally, we are told that a month of 30 days was omitted once every 160 years, so that 160 years were made equal to 1979 lunations and to 58440 days. As the correct length of 160 years was 58438.8 days and of 1979 lunations 58441.0 days, the error in each was only about one day in 160 years.

Long before the octaeteris can have reached its final form the Athenian astronomer Meton published his 19-year cycle, which began on June 27, 432 B.C., this being, according to Meton, the day of the summer solstice and the 13th day of the lunar month Scirophorion. The months in this calendar had the same names as the Attic months, and the intercalation was made as in the Attic calendar by repeating the sixth month, Poseideon. But the length of each year and month was made dependent on its place in the cycle, which also governed intercalation. In this cycle 19 years were made equal to 235 months and to 6940 days; the correct length of 235 months was 6939.69 days, and of 19 tropical years 6939.61 days, but Meton may have been aware of Naburianos' value for the year, which made 19 years equal to 6939.95 days.

An attempt to improve on this calendar was made by Callippus, who gave to the year its generally received value of 365.25 days, and combined four 19-year periods to form a period of 76 years, which he made one day shorter than four Metonic periods, so that it consisted of 27759 days, which he equated to 940 lunations. This made 19 years equal to 235 lunations and to 6939.75 days, a great improvement on Meton in respect both of the synodic month and of the tropical year. Callippus' first cycle was made to begin in 330 B.C., when the summer solstice and New Moon coincided. It appears to have been used by astronomers as a means of dating for two centuries.

The last of the Greek astronomical cycles was that devised by Hipparchus, who proposed to omit one day from every fourth Callippic cycle, thus making a cycle of 304 years equal to 3760 lunations and to 111035 days. This would give a length of 29.530585 days to the lunar month and of 365.24671 days to the year. The former approximates very closely to Cidenas' value, which Hipparchus had adopted; the latter is almost identical with the value assumed by the 19-year cycle in use at Babylon in Hipparchus' time and is still nearer to the value 365.24667, which he himself deduced from observations. Neither Hipparchus himself nor anyone else appears to have made use of this cycle.

The lunar calendar was not suitable for determining the proper season for agricultural operations. In order to know the exact time of the year the Greek farmer used to observe the annual risings and settings of certain of the fixed stars, and to note the solstices and the comings of birds. Hesiod gives some information in his *Works and Days* on this subject. In the fifth century B.C. *paraepgmata* showing the annual dates of the principal risings and settings and the weather that might be expected to follow them began to be constructed, and the published calendars of Meton and Euctemon included these. Fragments of Milesian *paraepgmata* of the second century B.C. are preserved. They are arranged according to the solar year, with a hole against each day and instructions, sadly mutilated, for showing the lunar month and day by means of movable pegs.

Roman Calendar.—The Roman calendar, which is now used throughout the whole world, had its origin in the local calendar of the city of Rome. It is generally stated by our ancient authorities that the year of Romulus consisted of 304 days divided into 10 months beginning with March, and that Numa introduced a lunar year and added January and February. It may be regarded as certain that the Roman months were originally lunar, and throughout the republican period the normal length of the year remained 355 days, exceeding 12 lunations by 0·63 days. This small excess could have been compensated by making the intercalary month consist sometimes of 27 and sometimes of 28 days. Such a month was in fact inserted, when it was considered necessary, after February 23. But at least in historical times the five last days of February were not repeated after the close of the intercalary month. As the days at Rome were generally enumerated in reference to the next following Kalends (1st of month), Nones (5th or 7th of month), or Ides (13th or 15th of month), it is a purely academic question whether the five days preceding the Kalends of March were part of February or part of the intercalary month. Both views can be supported from classical texts. At all events the failure to repeat these five days necessitated a departure of the calendar from the Moon. We do not know when this took place, but, if the eclipse of Ennius is correctly dated in the 350th year of the city, then we have an eclipse of the Sun on June 5 of the Roman calendar as far back as 400 B.C., and we may infer that the calendar had by that date worked free from the Moon. In historical times the months of March, May, Quintilis (July) and October contained 31 days each, the months April, June, Sextilis (August), September, November, December and January 29 days each, while February contained 28 days. In March, May, Quintilis and October the Nones were on the 7th day and the Ides on the 15th; in the other months the Nones were on the 5th day and the Ides on the 13th. The intercalary month was generally inserted in alternate years, but the actual regulation of intercalation was in the hands of the pontifices.

Under the pontificate of Julius Cæsar, who became Pontifex Maximus in 63 B.C., intercalation was neglected with such frequency that the Kalends of January, which had fallen on or about December 13 of the subsequent Julian calendar at the close of 64 B.C., fell on October 13 of that calendar at the close of 47 B.C. In order to restore the months to their normal position in the natural year, Cæsar not only gave the year corresponding to 46 B.C. the usual intercalation of 23 days after February 23, but inserted two additional intercalary months, amounting together to 67 days, between November and December, so that the Kalends of 45 B.C. fell on what is still called January 1 of the Julian Calendar. From that time each month has had its present duration, the sixth day before the Kalends of March being repeated when necessary. The intercalary day came to be called *ante diem bis sextum Kalendas Martias*, or more briefly *bissexturn*, whence our word bissextile for leap year.

The revised calendar, in framing which Cæsar had the assistance of the astronomer Sosigenes of Alexandria, adopted for the mean year the value current in Egypt, 365·25 days, three years out of four being given 365 days, and the fourth 366 days. As the calendar year was purely solar, the annual astronomical phenomena were expected to return annually on the same dates, and an almanac showing these dates was published with the new calendar. This rendered unnecessary the observation of these phenomena by farmers, who were now able to orientate themselves in the natural year by means of the new calendar.

Cæsar's edict requiring the intercalary day to be inserted every fourth year was

misunderstood by the pontifices, who reckoned the four years inclusively and intercalated at intervals of three years; in consequence the year 8 B.C. began three days too late. Augustus rectified this error by omitting all intercalations till A.D. 8, from which date the Julian calendar was observed strictly till the reform of Pope Gregory XIII in A.D. 1582. As the first year of the new calendar (45 B.C.) was a bissextile or leap year, it follows that years of the Christian era divisible by four are leap years. The name Quintilis was changed to July (Julius) in 44 B.C. in honour of Julius Cæsar and the name Sextilis was changed to August (Augustus) in 8 B.C. in honour of Augustus Cæsar; later attempts to change the names of months were unsuccessful.

The position of the Roman intercalary month agrees with the ancient tradition that March was originally regarded as the first month of the year. The years were commonly designated by the names of the consuls, so that the designation changed on the day when the new consuls along with the other curule magistrates entered office. After considerable fluctuation the date of entering office was fixed as March 15 about 222 B.C., but was transferred to January 1 in 153 B.C., and was never afterwards changed. In this way January became the first month of the official year. In the eastern provinces under the empire the years were often reckoned from the accession of the reigning emperor, his second year being made to begin on the first new year's day after his accession. The day which served as new year's day for this purpose varied from district to district. The January new year was in fact confined to western Europe.

Indictions.—The Cycle of the Indiction, a non-astronomical cycle of 15 years, is first mentioned in receipts for taxes collected in Egypt in A.D. 303 in respect of profits or produce of the fifth indiction (A.D. 301–302). It probably takes its origin in a provincial census for taxation following Diocletian's reconquest of Egypt in 297, a new census being taken every fifteen years. Each year in this cycle was regarded as a separate indiction. The earliest indictions appear to be reckoned from the Alexandrian new year, which fell generally on August 29, but, so long as it was strictly a financial year, the date from which the indiction was reckoned was frequently shifted according to the exigencies of public policy. The use of this cycle spread afterwards to other countries, where it was adopted as a means of designating years without special reference to public finance. There are various forms of the cycle, differing as to the day of their commencement. The Greek or Constantinopolitan indiction changed on September 1; the Roman indiction, which changes on December 25 or January 1, is rarely found before the 11th century.

To find the indiction corresponding to any year of the Christian era add 3 to the year and divide the sum by 15; the remainder (or 15 if exactly divisible) is the Roman indiction or the Greek indiction up to the day of change; if the indiction beginning in any year is required, 4 instead of 3 must be added.

Jewish Calendar.—The ancient Jewish calendar was of the normal lunar type with twelve months, each of which began with the first visibility of the crescent Moon. Intercalation was performed when necessary by repeating the twelfth month, which in post-exilic times was known as Adar. The responsibility for intercalation rested with the public authorities, and in the early centuries of the Christian era was vested in the Sanhedrin, regard being had to the progress of crops and stock with a view to the proper celebration of the Passover, which fell in the first month. The months are most commonly designated in the Old Testament and Apocrypha by their numerical order, which is always counted from the spring month of Abib or Nisan. Originally the months had the same names as are found on Phœnician

inscriptions, but in post-exilic times these were replaced by the Babylonian names. There are, however, in the Hebrew Scriptures references to the end of the year that would imply an autumn new year. This would be the agricultural year beginning with the autumn ploughing and ending with the vintage. In the book of Nehemiah regnal years are reckoned from the autumn month of Tishri, though everywhere else in the Old Testament they are reckoned from Abib or Nisan. Both beginnings of the year seem to be found in the Apocrypha, although as has been seen the months are always numbered from Nisan. In the last centuries before the Christian era the autumn new year was well established in Syria, and the reckoning of the year from Tishri is probably due to Syrian influence.

The papyri belonging to the Jewish colony at Elephantine in Southern Egypt in the fifth century B.C. show that at that place the beginning of the month was reckoned from the first evening when mean sunset or 6 p.m. followed mean new moon, so that we have a calendar determined by astronomical calculation, not by astronomical observation. There is, however, no reason to suppose that the Elephantine custom extended to Palestine. At Elephantine as in Palestine intercalation appears to have been irregular. The regnal years are reckoned from Nisan although the papyri are contemporary with Nehemiah who reckons such years from Tishri.

The empirical calendar has been superseded by one based on fixed rules, in which nothing is left to observation or discretion. The date when the modern calendar was designed is unknown, but it is commonly assigned to the fourth century of our era. This calendar is based on a rigorous determination of the mean new moon of Tishri, in which Cidenas' value for the mean lunation is used. Intercalation is governed by a 19-year cycle, and so the mean duration of the calendar year is the same as that which was adopted at Babylon in 383 B.C. The actual beginning of the calendar Tishri is obtained from the mean new moon by complicated rules which are designed to prevent certain solemn days from falling on inconvenient days of the week. The effect of these rules is that a common year may contain 353, 354 or 355 days, and an embolismic or leap year 383, 384 or 385 days. Ten of the months have fixed durations, the other two varying according to the requisite length of the year. The intercalary month always contains 30 days. It is placed next before the month Adar whose name and place it usurps; Adar itself becomes the second Adar or Veadar, and retains its normal length of 29 days.

The Jews now employ an era of the creation, whose epoch is taken as October 7 3761 B.C.

The Week.—In Assyria in the seventh century B.C. there was a general abstinence from work on the 7th, 14th, 19th, 21st and 28th days of each month, and these days, along with certain other days, were observed by a general abstinence from work in the first month of the year in Assyria in the tenth century B.C. It is not yet possible to state how old or how widespread this practice of abstaining from work on each seventh day was. The Mosaic law enjoined a general abstinence from work on each seventh day, which was called the Sabbath. It has been suggested that the Hebrew periods of seven days may, like the Assyrian, have been reckoned originally from the beginning of each month, but this is only surmise. When we come upon clear evidence, the Hebrew period of seven days was reckoned independently of the month and in fact of all astronomical periods. From the Jewish church it has passed into the Christian, in which special veneration is paid to the first day of the week, or Lord's Day (*κυριακή*, Dominica, dimanche).

Quite independently of the Jews there arose not long before the Christian era a group of astrological periods of seven hours, seven days, seven months and seven years respectively. According to Cassius Dio the astrological period of seven days was of Egyptian origin, and as it was based on the Egyptian practice of dividing the day and night separately into twelve hours, there is every reason to believe that his statement is correct. The seven planets, including the Sun and Moon, were arranged in the order of their supposed distance from the Earth, according to the theory that was current in Hellenistic Egypt:—Saturn, Jupiter, Mars, Sun, Venus, Mercury, Moon. Each of these in turn was supposed to control one hour, and the planet that controlled the first hour of the day, month or year was regarded as the regent of that day, month or year. A day of 24 hours, therefore, included three periods of seven hours and three hours of a fourth period, and the regent of each day would be removed by three places in the order of the planets from the regent of the preceding day. There was thus obtained the following series of regents of the days:—Saturn, Sun, Moon, Mars, Mercury, Jupiter, Venus. These planetary days acquired a rapid and world wide popularity, while the planetary hours, months and years interested none but astrologers. The first reference to a planetary day is in a poem by Tibullus written between 30 and 26 B.C. Although the planetary week began originally with the day of Saturn, the day of the Sun soon came to be more commonly regarded as the first of the week, partly, no doubt, because it coincided with the first day of the Jewish week. But the planetary hours continued to be enumerated from the hour of Saturn. Although there has been universal agreement in the attribution of individual days to individual planets, there has been no such agreement in the attribution of nights and hours. In the Teutonic languages the names Tiu, Woden, Thor and Freya of the Teutonic divinities with whom Mars, Mercury, Jupiter and Venus were respectively identified have taken the place of their Roman counterparts. But, while the planetary names for the days of the week have established themselves throughout western Europe, they are not in use among oriental Christians.

Ecclesiastical Calendar.—The Christian church has continued the Jewish festival of Passover, which as a Christian festival has received in our language the name of Easter. In Greek and Latin the identity was maintained by the use of the same name Pascha. According to Christian teaching the sacrifice of the Passover, which had been celebrated on Nisan 14, was fulfilled in the sacrifice of Christ. According to the Mosaic law the sacrifice of the Passover on Nisan 14 had been followed by a feast of seven days lasting till Nisan 21. The Christian churches in Asia Minor largely retained the Mosaic rule and celebrated Easter on the Jewish Nisan 14 without regard to the day of the week. With a few unimportant exceptions the rest of Christendom celebrated Easter on a Sunday, selected so as to fall within the passover week. It is found that when the customs hardened, the Church of Rome observed the Sunday which was believed to fall not earlier than the 16th nor later than the 22nd day of the Moon, that of Alexandria the Sunday which was believed to fall not earlier than the 15th nor later than the 21st day of the Moon, while the British churches observed the Sunday which was believed to fall not earlier than the 14th nor later than the 20th day of the Moon. There was heated controversy between the churches of Rome and of Asia Minor on this subject in the second century. In the third century Christian churches, refusing to accept the authority of the Jewish councils to decide which month was to be regarded as Nisan or on which day it was to begin, began to construct tables of their own for computing the 14th day of the Easter month and the date of Easter. Two cycles dating from that century obtained a wide currency—the Roman cycle of 84 years and the Alexandrian of 19 years.

The Alexandrian cycle was simplicity itself. March 21 of the Julian calendar was regarded as the date of the vernal equinox, and all Alexandrian, and therefore all Julian years, were treated as of equal duration. The cycle was made to begin in the year that placed a new moon on the Alexandrian new year's day, August 29-30, and, in consequence, gave April 5 as the date of the 14th day of the Easter moon. This 14th day was placed 11 days earlier in each year than in the preceding year when this could be done consistently with its not falling before March 21. Where this was impossible, it was placed 19 days later than in the preceding year. Finally, in passing from the 19th to the 1st year of the cycle, an interval of 12 days instead of 11 was allowed, so as to bring the 14th day in the 1st year of the next cycle back to April 5. Easter day was the first Sunday after the 14th day of the Easter moon. This calendar assumed the same mean length of the year and the lunar month as the Callippic cycle and was therefore subject to the same errors. Its authors can hardly have expected it to remain uncorrected for many cycles. As a cycle it was subject to the inconvenience that it took 532 years for the whole series of Easter dates to recur.

The Roman cycle of 84 years was made to begin in a year in which a new moon fell on the Roman new year's day, January 1, and also on the Sabbath (Saturday). It made 84 tropical years equal to 1039 lunations and to 30681 days. The correct length of 84 tropical years was 30680.36 days, and of 1039 lunations 30682.29 days, so that the equinox fell 0.64 days earlier as compared with the assumed date every 84 years, and the new moons 1.29 days later as compared with the assumed dates in the same interval. The error in the length of the year was the same as in the Alexandrian cycle, but the error in the length of the lunation was nearly five times as great as in the Alexandrian cycle and was in the opposite direction. A further difference arose from the facts that the Roman rule treated the 16th, while the Alexandrian treated the 15th day of the moon as the earliest date for Easter, that the Roman rule accepted a 14th day of the month even if it fell before the equinox, so long as the resultant Easter fell after the equinox, and that the Roman rule regarded April 21 as the latest date for Easter, while the Alexandrian rule permitted it to fall as late as April 25. During the fourth and the first half of the fifth centuries differences between the two calendars were often, but not always, settled as they arose by agreement between the Roman pope and the patriarch of Alexandria, but long before the end of the fourth century it had come to be the practice that it was always the Roman Church that gave way.

In 325 the General Council of Nice dealt with the date of Easter. Its decision is expressed in its epistle to the Church of Alexandria:—"We also send you the good news concerning the unanimous consent of all in reference to the celebration of the most solemn feast of Easter, for this difference also has been made up by the assistance of your prayers, so that all the brethren in the East, who formerly celebrated this festival at the same time as the Jews, will in future conform to the Romans and to us and to all who have from of old kept Easter with us."

A cycle of 532 years based on the 19-year cycle was composed by Victorius in A.D. 457 at the request of the Pope. It agreed with the Alexandrian cycle in the mean lengths of the year and month, but there were minor differences, which from time to time gave different dates for Easter. The papal Curia did not hold itself bound to any of the three cycles, and local usage varied. The last year in which the 84-year cycle was followed in Rome against both the Alexandrian and the Victorian cycles was A.D. 501.

The Alexandrian cycle found a capable exponent at Rome in the person of

Dionysius Exiguus about A.D. 530. He constructed an Easter table extending from A.D. 532 to A.D. 626, in which he introduced for the first time the years of the Christian era, which was adopted from him by Bede and from Bede by western Christendom generally. The only part of the furniture of a late mediæval Easter table that was not used by Dionysius was the solar cycle, which would appear to have been first used by Maximus Confessor in Africa in A.D. 641.

The British and Irish churches continued to use the 84-year cycle in a form that permitted Easter to fall as early as the 14th day of the moon and gave March 25 as the earliest possible date of Easter. But at the Synod of Whitby in A.D. 664 King Oswy of Northumbria under the influence of Wilfrid decided to adopt the Dionysiac system. The decision was accepted by the other English communities, and Bede, the Northumbrian church father, was brought up to the use of the Dionysiac system. His *De temporum ratione*, written in 725, included not merely an exposition, but an Easter table for the 532 years from A.D. 532 to 1063, and rapidly became the standard treatise on the subject. Before the end of the eighth century the 84-year cycle had been abandoned by the last of the British churches, and even in France the Victorian cycle had given way to the Alexandrian.

Gregorian Calendar.—As the centuries advanced, the gradual shifting of the calendar dates of the seasons did not escape attention. In fact in 11,000 years or so January would have ceased to be a winter month. Dante* refers to this as follows:—

Ma prima che gennaio tutto si sverni,
per la centesima ch'è laggiù negletta.

"But, ere that January be all unwintered by that hundredth part neglected upon earth."

The hundredth part is here the difference between the mean calendar year of 365·25 days and a supposed tropical year of 365·24 days.

The defect of the calendar in the sixteenth century showed itself mainly in its effect on the date of Easter, since the tables in use placed both the vernal equinox and the Easter full moon, or more exactly the 14th day of the Easter moon, later than their true dates. Accordingly in 1582 Pope Gregory XIII published a bull instituting a revised calendar. He considered it desirable to restore the vernal equinox to the position assigned to it in the Easter tables, namely March 21, and accordingly ordained that the day after 1582 October 4 should be called October 15. In future the intercalary day, which in the Julian calendar was inserted once every four years, was to be dropped in those centennial years that were not divisible by 400. Thus 1600 and 2000 were to be leap years, but not 1700, 1800 and 1900. The effect of this was to make the mean length of the year 365·2425 days, a duration that was correct about the third century B.C., but is slightly in excess of the present length of the year. The reform has the merit of treating the simple Julian system as correct for one or two centuries at a time and making corrections in centennial years only. The same simplicity marked the new treatment of the lunar month. The dates of the Easter full moons were put back three days, or advanced seven days if we include the reduction to the Gregorian year. If this involved placing the 14th day of the Easter moon later than April 19, the full moon of the previous lunation was accepted, so that the date of the Easter moon was put back 23 days in the calendar. If the shift involved placing the 14th day of the moon on April 19 it was placed on April 18 instead.

A similar shift was to be made in centennial years, if required. There was to

* *Paradiso*, XXVII, 142, 143.

be a forward shift of one day in every centurial year that was not a leap year, and a backward shift of one day in 8 out of every 25 centurial years. This backward shift was to be made for the first time in 1800, then at seven intervals of 300 years and one of 400 years, and so on. If a backward and forward shift were due in the same centurial year the dates of the full moons were to be the same in each year of the 19-year cycle as in the preceding century. The calendar was to be worked as if the dates of full moon for each year of the cycle were to range from March 21 to April 19 inclusive, except that all full moons that should have fallen on April 19 were to be put back to April 18, and, whenever this was done, a full moon that was due for April 18 in another year of the cycle was to be put back to April 17. The object of this exception was to retain April 18 as the last possible date for the Easter full moon.

But transferences of full moon dates under this exception do not affect the subsequent dates of full moon for the particular place in the 19-year cycle. Thus the full moon of the 14th year of the cycle, which in the unreformed calendar had stood on April 12, was placed on April 18 after the reform and not on April 19, but the forward shift of one day in 1700 brought it to March 21 as if it had been on April 19. Similarly the full moon of the 6th year was shifted in 1700 from April 17 to April 18, but in 1900 it remained at April 18 instead of being shifted to April 19. The result of this was that the full moon of the 17th year, which should have been shifted to April 18 in 1900, remained at April 17. Its next forward shift will be to April 18, taking the place of April 19, and then to March 21. The effect of this exception is that every full moon date gets two turns either on April 17 or on April 18, so that, although the total range of full moon dates is only 29 days inclusive, it takes 30 forward shifts to bring the full moons back to their former positions.

Altogether 5,700,000 Gregorian years are made equal to 70,499,183 lunations and to 2,081,882,250 days, so that the mean length of the lunation is taken as 29.5305869 days, a value that is in error by the millionth part of a day at the present moment, but will be correct in the course of 300 years. Since 400 Gregorian years contain 146,097 days or 20,871 weeks, the days of the week recur on the same days of the year every 400 years, and there should therefore be a recurrence not only of Easter full moons, but also of Easter Sundays, after the lapse of a complete cycle of 5,700,000 years.

This calendar combines the merits of extreme accuracy in its mean values with extreme simplicity in its application, since for a period varying from one to three complete centuries it is able to determine the date of full moon as if all calendar years were of equal duration and as if the 19-year cycle were exactly applicable, so that a table as simple as that used for the unreformed calendar will hold good for that length of time. The calendar is independent of differences of meridian. It makes the moon full on one particular day for the whole world without specifying any particular moment. The astronomical Full Moon takes place at a particular moment, which will fall on different calendar days according to the meridian selected, being more often than not on a different calendar day in Australia and in Canada. The time of astronomical Full Moon is also affected by inequalities in the motion of the Sun and Moon. The calendar full moon is not affected by these inequalities, just as the time used in civil life is not affected by inequalities in the length of the day. It follows, therefore, that the simple tables of the Prayer Book and the elaborate tables used in H. M. Nautical Almanac Office must occasionally differ in their final results.

The Gregorian calendar was adopted in Italy, France, Spain, Portugal and

Poland in 1582, by most of the German Roman Catholic states and by Holland and Flanders in 1583, and by Hungary in 1587. The adoption in Switzerland was gradual; it began in 1582 and was completed in 1812. The German and Dutch Protestant states generally, along with Denmark, adopted it in 1700, the British dominions in 1752, Sweden in 1753, and Japan in 1873. It became the official calendar of China and Albania in 1912, Bulgaria in 1916, Soviet Russia in 1918, Rumania and Greece in 1924, and Turkey in 1927. The rules for Easter have not, however, been adopted by those oriental churches that are not subject to the papacy.

The German Protestants, in adopting the Gregorian calendar, did not adopt the Gregorian rules for the computation of Easter, but enacted that both the date of the equinox and the date of the Easter full moon should be determined astronomically with the Rudolfine tables and the meridian of Uranienborg (in the island of Hveen between Denmark and Sweden). This astronomically determined Easter was used by the German Protestants from 1700 to 1776 and by the Swedes from 1740 to 1844.

In the British dominions the change of calendar was effected by giving the name September 14 to the day after September 2 in 1752. The difference between the Julian and Gregorian calendars, which was 10 days in 1582, is now 13 days, but the Alexandrian and Gregorian Easters may be as much as 5 weeks apart.

It is provided by the Easter Act, 1928, that "Easter-day shall, in the calendar year next but one after the commencement of this Act and in all subsequent years, be the first Sunday after the second Saturday in April." The Act is to commence and come into operation on a date to be fixed by Order in Council, but no such Order in Council is to be made until a draft order has been approved by resolution by both Houses of Parliament "either without modification or with such modifications to which both Houses agree." Before making such draft order, regard is to be had to any opinion officially expressed by any Church or other Christian body. The Act is to extend to the United Kingdom, the Isle of Man, and the Channel Islands, and may be extended by Order in Council to any other part of His Majesty's dominions except British India, the Dominion of Canada, the Commonwealth of Australia (including Papua and Norfolk Island), the Dominion of New Zealand, the Union of South Africa, the Irish Free State and Newfoundland. The effect of these provisions is to expedite procedure, but to postpone final decision on the change in the calendar.

Differences of Style.—The Christian era invented by Dionysius Exiguus and popularised by Bede has been adopted at different times and in different countries with different initial days for the year. The most common initial dates have been December 25, January 1, March 1 and March 25. These different reckonings of the year were known as *styles*. Thus in Italy down to the eighteenth century the years of the Christian era began in the Venetian style on March 1, in the Pisan style on the preceding March 25, and in the Florentine style on the following March 25, while at Rome different styles were used for different purposes. In England the Nativity style beginning on December 25 was superseded in the fourteenth century by the Annunciation style beginning on March 25, but the Circumcision style beginning on January 1 was substituted in 1752 by the Act that introduced the Gregorian calendar. In Scotland the year had begun officially on January 1 since 1600. The names old style and new style were, however, used to distinguish not the different dates for the beginning of the year, but the Julian and Gregorian calendars, each of which has been used with different initial dates.

In the classical languages the numerical designation of years is always by ordinal numbers, so that the Christian era begins with the beginning of the year 1 or of the first year. The year immediately preceding is the year 1 B.C. or the first year before Christ. The year before 1 is styled 0 by astronomers, and the preceding year is -1, corresponding to 2 B.C. in the usage of historians. Therefore in converting years B.C. into astronomical dates it is necessary to subtract 1 and to prefix the minus sign. In converting negative astronomical dates into years B.C. it is necessary to remove the minus sign and to add 1 to the number of the year.

Sunday Letter, Solar Cycle, Golden Number, Epact.—The Roman calendar makers were accustomed to place the letters A, B, C, D, E, F, G and H in rotation against the days of the year. At first these letters referred to the Roman market week of eight days. Then if the first market day in any year were known, as for instance January 5, the letter E standing against that day would indicate all the market days in the year. The next device was to use the same series ending with G to indicate the seven days of the planetary week, which coincides in practice, though not in origin, with the Christian week. The letter that stands against the Sundays in any year is known as the *Sunday Letter* or *Dominical Letter* of that year. Since no letter is placed against the intercalary day, it follows that in leap years the Sunday Letter retrogrades by one place at the date of the intercalation. Thus in 1936 E will be the Sunday Letter in January and February, and D from March onwards. As the ordinary year contains 52 weeks and 1 day, the Sunday Letter also retrogrades one place at the beginning of each year. The series of letters has always been made to begin on January 1 as in the pre-Christian Fasti, whatever day may have been adopted for the beginning of the civil year.

In the Julian calendar the days of the year recurred on the same days of the week in 7×4 years, thus giving rise to the so-called *Solar Cycle* of 28 years, which could be used for the purpose of finding the day of the week for any day in a known year. The years of this cycle are commonly shown in almanacs, but it has been very little used in practice. There is mention in the Talmud of a 28-year cycle, at the close of which the vernal equinox, supposed to recur at intervals of $365\frac{1}{4}$ days exactly, would return both to the same planetary hour and to the same day of the week. The beginning of each 28-year cycle is still observed by the Jews, but has ceased to have any calendrical or astronomical significance. As has been seen above the solar cycle for correlating the week with the Julian calendar appears to have been first used by Maximus Confessor in A.D. 641. Supposed older works which mention this cycle have probably been misdated.

The tables for finding Easter according to the Alexandrian calendar tabulated the days from March 21 to April 18 and placed against each day the number of the year in the 19-year cycle in which the Easter full moon would fall on that day. The numbers so tabulated have from the later middle ages been known as *Golden Numbers*. The same tables placed against each day its Sunday Letter. So that to find the date of Easter all that was required was to see against which day the Golden Number of the year stood and then to see which was the next day against which the Sunday Letter of the year stood; the day so found would be Easter day. This method is retained in the English Prayer Book, but the positions of the Golden Numbers have to be changed in the centurial years whenever the date of the Easter full moon corresponding to a given year of the 19-year cycle is changed.

In the tables issued by authority of Pope Gregory XIII, Easter is found by means of *Epacts* instead of by Golden Numbers. The Epact is the age of the moon on some fixed day of the calendar year. In the Alexandrian Easter tables the age

on the first day of the Alexandrian calendar (August 29–30) was shown. Dionysius Exiguus and Bede, writing for a western public, preferred to describe this as the moon's age on March 22. Tables adapted to the Roman cycle of 84 years showed the moon's age on the first day of the Roman year, January 1. So also do the tables adapted to the Gregorian calendar. If the moon's age on the first day of the year is known, then by counting months of 30 days and 29 days alternately, the approximate age of the moon is known for every day of the year. The epacts in the Easter calendars vary in the same manner as the Golden Numbers. The English Prayer Book shows the epact, but makes no use of it.

Movable Festivals.—In the ecclesiastical calendar some holy days are observed on fixed days of the year. Others, known as movable festivals, are observed on fixed days of the week. Most of these are at fixed intervals before or after Easter Day. The following holy days dependent on the date of Easter are shown in the *Nautical Almanac*.

Days before Easter			Days after Easter		
Septuagesima Sunday	...	63	Low Sunday	...	7
Quinquagesima Sunday	...	49	Rogation Sunday	...	35
Ash Wednesday	...	46	Ascension Day	...	39
Quadragesima Sunday	...	42	Whit Sunday	...	49
Palm Sunday	...	7	Trinity Sunday	...	56
Good Friday	...	2	Corpus Christi	...	60

The First Sunday in Advent is the fourth Sunday before Christmas Day, and is therefore the nearest Sunday to November 30.

Julian Period.—The French Protestant scholar and chronologist Josephus Justus Scaliger invented the Julian Period as a practically continuous measure of time. It combines the Solar Cycle of 28 years, the Lunar Cycle of 19 years and the Cycle of the Indiction comprising 15 years, thus containing $28 \times 19 \times 15 = 7980$ years altogether. All these cycles are supposed to begin on January 1 of the Julian calendar, and it is found that they began together in 4713 B.C., so that one Julian Period includes all dates both in the past and in the future to which reference is likely to be made, and to that extent has an advantage over an era whose epoch lies within the limits of historical time.

The years of the Julian period are seldom employed now, but the day of the Julian period is frequently used in astronomy and in calendrical tables. It is the only method of enumerating days that is free from their combination into months and years, and is therefore particularly useful where an exact interval in days is required. The Julian days are numbered consecutively from Greenwich mean noon on January 1 4713 B.C., at which date the Julian Day was 0.0.

Mohammedan Calendar.—The Mohammedans use the Era of the Hegira beginning with the year of Mohammed's flight or Hegira in A.D. 622. The peculiarity of the Mohammedan calendar is that each year consists of 12 lunar months without intercalation, so that each month goes the round of the seasons in 33 years. For religious purposes the beginning of each month is fixed by observation of the lunar crescent. For the purposes of civil life there has never been an exact rule, and different beginnings of the month have been used by different people living in the same town. It is, therefore, impossible to give an exact interpretation to a date expressed in this calendar unless the day of the week is given as well as the day of the month; this applies both to public and to private documents. For astronomical purposes a more exact rule is followed; the months have 30 days

and 29 days alternately, except the 12th month, which has 29 days nineteen times and 30 days eleven times in a cycle of 30 Mohammedan years. In consequence the calendar makes 360 lunations equal to 10631 days; their real duration is 10631.012 days. The error, therefore, amounts to no more than a day in 2500 years. There are two forms of this cycle; they give dates differing by one day in 348 of the 360 months of the cycle.

Subdivisions of the Day.—From a remote antiquity the Egyptians divided each day and each night into twelve equal hours. These necessarily varied in length with the season of the year and were in consequence termed *ὥραι καιρικαί* in Greek and *horæ temporales* in Latin. The same method of dividing the day and night was used along with other methods in Babylonia and Assyria, where each day and each night was divided into three watches, each of four temporal hours.

In astronomical observations and predictions the Babylonians expressed time in *bēru*, *geš* and *G.A.R.* The whole interval of day and night combined was divided into twelve *bēru* of uniform length, each *bēru* into thirty *geš* and each *geš* into sixty *G.A.R.* The division of the day into *bēru* and *geš* was probably on the analogy of the division of the year into twelve months of thirty days each. From being measures of time these terms appear to have become measures of hour angle and finally measures of arc and of angles generally. The *geš*, which was the 360th part of the day, survives in our degree. The sexagesimal subdivision of the *geš* is in accordance with the Sumerian system of arithmetical notation, inherited by the Babylonians*, which was similar to our own decimal system of expressing both integers and fractions except that it was sexagesimal throughout instead of decimal. These intervals of time were measured to or from sunrise or sunset.

In Kidinnu's tables the *bēru* is not used, but the interval from midnight to midnight is divided into six mean watches. The *geš* as the sixtieth part of the mean watch, and the *G.A.R.* as the sixtieth part of the *geš* form the next subdivisions, and the *G.A.R.* in its turn is divided into sixty parts, so that the whole subdivision of the mean watch is strictly sexagesimal. While for civil and religious purposes and for astronomical observations and predictions the day was reckoned from sunset, Kidinnu reckoned it from midnight, which is obviously a more convenient starting point for astronomical tables.

The division of day and night into temporal hours spread through the Græco-Roman world during the Hellenistic period. These were always numbered from sunrise and sunset, although the official beginning of the day varied from one country to another. Thus at Athens and in western Asia the day began officially at sunset, and at Rome at midnight, while in Egypt the night was generally regarded as lying between two days, and the numbers of both days are given to express the time at night. Sun-dials were devised to shew the temporal hours and Ptolemy introduced lines on the astrolabe for this purpose.

For astronomical purposes the equinoctial hour, i.e. the mean temporal hour or the temporal hour with the length that it had at the equinoxes, was introduced; it is found first in Hipparchus. According to Pliny, he, like the Babylonians, reckoned the day from midnight. Ptolemy in the tables in the *Almagest* reckoned the day from mean noon of Alexandria and divided the whole day into sixty equal parts, each of which was divided sexagesimally, as far as was necessary. But it appears that in his *Manual Tables*, he divided the whole day into equinoctial hours reckoned from mean noon of Alexandria, and subdivided these sexagesimally, thus having our system of 24 equal hours to the day, with a subdivision into minutes and

* See F. Thureau-Dangin, *Esquisse d'une histoire du système sexagésimal* (1932), especially chapter V.

seconds. Apart from the selection of mean noon as the initial point this was probably the same system as that of Hipparchus. The 24-hour system reckoned from mean noon established itself in astronomical tables and ephemerides generally within the limits of Greek, Latin and Arabic civilisation, and, subject only to changes in the adopted meridian, remained in use till 1925.

The use of temporal hours for the ordinary purposes of life was not disturbed till the invention in the fourteenth century of mechanical clocks, striking the hours. It was well nigh impossible to make clocks strike hours of unequal length, and in consequence these clocks struck the equinoctial hours from the first. In Italy and Bohemia clocks were set to number and strike the hours from dusk or about half an hour after sunset and the hours were numbered up to twenty-four, though, so far as striking was concerned, the twenty-four hours were in some clocks divided into two series of twelve, the second series beginning twelve equinoctial hours after dusk. In most other countries the clocks both numbered and struck the hours in two series of twelve hours beginning at midnight and noon respectively. In England, where these hours were used extensively before the end of the fourteenth century, hours so reckoned were described as "of the clock" or "o'clock", to distinguish them from the older reckoning of hours of the day and night. The two series of twelve hours were from the first commonly distinguished as "before noon" (*ante meridiem*) and "after noon" (*post meridiem*). The introduction of the equinoctial hour into civil life was accompanied by the introduction of its astronomical subdivisions, the minute and the second. Sun-dials constructed to show equinoctial time measured from midnight and noon have been constructed since the fifteenth century.

The Italian method of reckoning time up to 24 hours from dusk was abandoned in the early part of the nineteenth century, except in Turkey where time was still reckoned in two series of equinoctial hours beginning at sunset and twelve hours after sunset respectively.

The time used for civil purposes from the introduction of clocks till the close of the eighteenth century was local solar time. The substitution of mean time took place in most countries late in the eighteenth or early in the nineteenth century, at London in 1792.

The development of railways led to the adoption of a single meridian for each country or each railway administration, Greenwich time being made the legal time in Great Britain in 1848. Afterwards the time referred to local meridians gave place in most countries to zone time, differing from Greenwich time by a whole number of hours (or occasionally half-hours), adopted in Sweden in 1879, on most of the American railways in 1883, and in most European countries before the end of the nineteenth century.

Since 1916 various countries or places have for part of the year adopted for civil purposes a reckoning of time known as "summer time", one hour in advance of the time reckoned from the adopted mean noon or mean midnight. As this reckoning is governed only by practical convenience, there has been no uniformity in the action of the authorities that have adopted it.

From the beginning of 1925 the principal ephemerides have reckoned the day and numbered the hours from mean midnight to mean midnight instead of from mean noon to mean noon. The same system, adapted when necessary to zone time and summer time, has since the last years of the nineteenth century been used in various places for various non-astronomical purposes, mostly of an official or semi-official character.

TIME

The astronomical clock, by means of which time is measured, is the Earth, whose axial rotation causes the heavenly bodies to appear to revolve round the Earth from east to west. For the hands of this clock the Sun, Moon or stars may be selected, and different times will result according to the choice made. The most convenient unit of measure for time is the day, which is defined as the interval between successive transits (over the same meridian) of the heavenly body by which the time is measured. If the heavenly bodies were absolutely fixed, all days would be of the same length, this length corresponding exactly to the Earth's period of rotation. But the movements of the various heavenly bodies or other reference points are different and non-uniform, and consequently days of different and varying length arise.

The **apparent solar day** was formerly considered to begin and end at **apparent noon**, the moment when the centre of the true Sun is on the upper meridian, but since 1925 January 1 it has been considered to begin and end at apparent midnight, the moment of lower meridian passage of the true Sun. It is divided into 24 hours, and the time resulting is called **apparent time**. Thus apparent time at any instant is the westward hour angle of the true Sun $+ 12^h$.

Owing to the non-uniform motion of the true Sun in right ascension, arising partly from the fact that it moves in the ecliptic and not in the equator, and partly from the eccentricity of the Earth's orbit, the apparent solar day is of variable length, and is therefore not suitable as a measure of time, because the clocks made by man to record time are, of necessity, designed to move uniformly. Hence a fictitious mean sun is conceived which moves *uniformly** in the equator with the same mean motion as that of the true Sun. The interval between successive transits of this mean sun constitutes the **mean solar day**, which is the common day of civil life, and gives rise to **mean solar time**, or more simply **mean time**.

As the mean sun crosses the meridians on the earth at different moments, there arise numerous **local mean times**, each defined by the passage of the mean sun across a particular meridian. To avoid the confusion that would ensue if these were all in use, it is convenient to regard the time of some one meridian as a standard. By common consent the meridian of Greenwich is universally accepted as the prime meridian, and **Greenwich Mean Time**, usually abbreviated G.M.T., is the standard to which all other mean times are referred. Since the Earth rotates uniformly on its axis, and since longitudes are measured uniformly round the Earth from the meridian of Greenwich, it follows that the difference between Greenwich mean time and the local mean time of any place is equal to the longitude of that place. Denoting by λ the longitude, considered positive to the west, we have, since the Earth rotates from west to east,

$$\text{Local mean time} = \text{G.M.T.} - \lambda$$

In actual practice it would be extremely inconvenient if local mean times were adopted by each community, so the time over a large area is reckoned from some one convenient meridian, and called the **Standard Time** for that area or country. Usually the standard time differs from Greenwich mean time by an integral number of hours. A list of the standard times adopted by the principal countries of the world is given on pages 704-713. In some countries the legal time during the summer months is in advance of the standard time, and is then usually designated **Summer**

* See also page 785.

Time. This time is, however, never used in astronomical ephemerides, or in the recording of astronomical observations.

In the case of a vessel at sea the term **Ship Mean Time** is frequently used instead of **Local Mean Time**. This must not be confused with **Ship Time**, which is the time shown by the ship's clocks. In the merchant and passenger services it is customary to alter the clocks each night by an integral number of minutes so that at local noon on the following day the ship time shall be approximately 12^h. In the British Navy **Zone Times**, differing by integral hours from Greenwich mean time, are used. Each zone extends for 7°·5 or 30^m on both sides of the meridian from which it takes its name. Thus all vessels between longitudes 22°·5 and 37°·5 west would use the zone time +2^h, i.e. G.M.T. - 2^h.

Before 1925 January 1 the astronomical day was considered to begin at mean noon, or at the moment of upper meridian passage of the mean sun, and astronomical clocks indicated 0^h at that moment and 12^h at mean midnight. Greenwich mean time was then usually defined as the Greenwich westward hour angle of the mean sun. Since that date, however, the day has been considered to begin at mean midnight, or the time of lower meridian passage of the mean sun, and the definition of Greenwich mean time has been changed so that it is now the Greenwich hour angle of the mean sun + 12^h. Thus the astronomical day 1924 December 31 was only 12 hours long and 1924 December 31·5 old time reckoning is the same as 1925 January 1·0 new time reckoning. Since, as far as the *Nautical Almanac* is concerned, no change of name has been made, but merely a change of definition, it is highly important that in expressing all times prior to 1925 January 1 the old definition should be the only one permitted, while in the case of times since that date the new definition should be followed rigorously. It has been felt by some astronomers that a new name should be given to the time commencing at midnight, and in the *American Ephemeris* and the *Connaissance des Temps* the term **Greenwich Civil Time** (G.C.T.) is used, in the *Berliner Jahrbuch Weltzeit* (World Time), while a number of astronomers have adopted **Universal Time** (U.T.). For cases where it is desired to express a time after 1925 January 1 by the former method of reckoning, the term **Greenwich Mean Astronomical Time** (G.M.A.T.) is now reserved.

The difference between mean time and apparent time is known as the **equation of time**. This quantity is also the difference between the hour angles of the mean and true suns, or between their right ascensions. When this term was first introduced it was the practice to determine apparent time from a sun-dial, or from observations of the Sun, so that the equation of time was then considered to be mean *minus* apparent time, or the correction to be applied to apparent time to reduce it to mean time. To-day mean time is ascertained by the astronomer by conversion of the sidereal time obtained from stellar observations, and by the navigator from wireless signals, so that the *Nautical Almanac* now tabulates the correction to be applied to mean time to give apparent time.

The interval between two successive passages over the meridian of any place of an equatorial star without proper motion constitutes the **sidereal day**, properly so-called. This interval is 23^h 56^m 04^s·100 of mean solar time, and equals, of course, the period of the Earth's axial rotation. But in actual practice transits, not of a star, but of the position of the vernal equinox or first point of Aries, are used to define the sidereal day. Since the equinox has an annual retrograde motion along the ecliptic of about 50", due to precession, the adopted sidereal day is 0^s·009 shorter than the period of rotation, and is, therefore, 23^h 56^m 04^s·091, measured in mean solar

time. From this figure the mean solar day is easily deduced to be $24^{\text{h}} 03^{\text{m}} 56^{\text{s}}.555$ of sidereal time. A sidereal clock, showing **sidereal time**, will indicate 0^{h} at the moment of passage of the vernal equinox, and will divide the sidereal day into 24 sidereal hours.

The **right ascension** of a body may be defined as the interval, measured in sidereal time, between the transit of the vernal equinox and the transit of the body. In other words, when the body is on the meridian the sidereal time is equal to its right ascension. Applying this principle to the mean sun it follows that the sidereal time at the moment of meridian passage of the mean sun, which, by definition, is mean noon, is equal to the right ascension of the mean sun. Thus it is essentially a knowledge of the right ascension of the mean sun that permits the conversion of mean time into sidereal time or vice versa. At mean midnight the sidereal time is obviously 12^{h} greater than the right ascension of the mean sun, and in the *Nautical Almanac* this right ascension, increased by 12^{h} , is given for every midnight or 0^{h} under the heading "Sidereal Time". The sidereal time at any moment may be found by adding the equivalent in sidereal time (taken from Table III) of the mean time to the sidereal time at 0^{h} . The inverse problem may be solved by subtracting the sidereal time at 0^{h} from the given sidereal time, and converting the remainder into mean time by Table IV.

An alternative method of conversion is afforded by the tabulation of the mean time of **transit of the first point of Aries**, which is computed by converting the complement to 24^{h} of the sidereal time at 0^{h} into its equivalent interval of mean time. The conversion of mean to sidereal time may be effected by subtracting the time of previous transit from the given mean time, and converting the remainder into its equivalent interval of sidereal time (Table III). A given sidereal time may be converted into an equivalent interval of mean time (Table IV) and added to the *preceding* transit of the first point of Aries to yield the corresponding mean solar time.

A complication is introduced by the fact that the precession of the equinoxes is not uniform, but is affected by irregularities known as **nutation**, due to solar and lunar perturbations. The **mean equinox** of date is conceived to be a point moving uniformly (except for a slight secular acceleration) along the equator, while the difference in right ascension between this point and the true equinox (in the sense true — mean) is called **nutation in right ascension**. This may amount to about $\pm 1^{\text{s}}.2$. The right ascension of the mean sun is measured from the true equinox, and hence does not increase uniformly, nor are the sidereal days, measured by transits of the true equinox, of equal length. This is illustrated by a table showing the sidereal time at 0^{h} at intervals of 90 days.

Date		Sidereal Time at 0^{h}		
		^h	^m	^s
1935 Jan. 1	I	6	38	52.185
			^h	^m ^s
			5	54 50.011
Apr. 1	I	12	33	42.196
			5	54 50.053
June 30		18	28	32.249
			5	54 49.968
Sept. 28		0	23	22.217
			5	54 50.050
Dec. 27		6	18	12.267

The nutation is, for convenience, usually divided into two parts. One part, depending on the longitude of the Moon's node, the Sun's longitude and the longitude of the Sun's perigee, constitutes the long-period terms, while the other, involving functions of the Moon's longitude, constitutes the short-period terms. The long-period terms have a principal period of 18 years and vary between $\pm 1^s.2$; the principal short-period term has a period of half a lunar month, or nearly 15 days, while the combined effect of the short-period terms may attain $\pm 0^s.020$.

The introduction of clocks led to the necessity for mean solar time; the accurate time-keeping of modern clocks is leading to the use of a mean or **uniform sidereal time**, related to true sidereal time as determined by transit circle observations of stars by the equation

$$\text{Uniform sidereal time} = \text{true sidereal time} - \text{nutation}.$$

The following table shows the analogy between solar and sidereal times:—

	Solar	Sidereal
Observations determine ...	Apparent solar time ...	True sidereal time
Clocks keep ...	Mean solar time ...	Uniform sidereal time
The difference is ...	Equation of time ...	Nutation in R.A.

To facilitate the use of uniform sidereal time, the sidereal time and the nutation in right ascension are tabulated to three decimals, and include the short-period terms. The mean time corresponding to a given uniform sidereal time is the mean time equivalent of (given uniform sidereal time — true sidereal time at 0^h + nutation at 0^h).

All ephemerides are computed on the assumption that time moves uniformly, and that the length of a day, whether mean solar or uniform sidereal, is invariable, except for a small recognised secular variation. It is now believed that the rotation of the Earth, upon which the length of the day depends, is not constant. Such a change, although imperceptible from day to day, would lead to a cumulative error in time reckoning, so that the observed time as shown by a clock might differ by many seconds from the time that the compilers of the tables of the Sun, Moon and planets expected the clock to show at a given moment, the effect of this error being revealed, not as an apparent clock error, but as an apparent error in the ephemerides of the Sun, Moon and planets. It was the correlation of these apparent errors that led to the announcement of the variability of the Earth's period of rotation.

The ephemerides in the *Nautical Almanac* are all based strictly on the tables mentioned, and, except in the case of eclipses and occultations, no attempt is made to correct the positions derived from the tables in order to bring them into accord with modern observations. There are two reasons for this policy; firstly because subsequent comparison of observations with theory is rendered less certain if arbitrary and changing corrections are applied to the theoretical positions, and secondly because the ephemerides of the Sun, Moon and planets may be prepared for as much as ten years in advance of final publication. For refined work, such as the determination of the definitive orbit of a comet or minor planet, or the preparation of an accurate ephemeris of such a body, it may be deemed advisable to apply corrections based on recent observations. This is most conveniently done, in the case of the Sun and Moon, by adopting a value of the correction ($\Delta\lambda$, in seconds of

arc) to the mean longitude, and then entering the ephemeris at a time differing from the given G.M.T. by the time required by the body to move through $\Delta\lambda$ seconds of mean longitude. Since, at present, both $\Delta\lambda_0$ and $\Delta\lambda_1$ are positive, the correction required by a G.M.T. before entering the ephemeris is

$$\begin{aligned} &+0^d\cdot000282 \Delta\lambda_0 \text{ for the Sun} \\ &+0^h\cdot000506 \Delta\lambda_1 \text{ for the Moon.} \end{aligned}$$

For the year 1935, $\Delta\lambda_0$ and $\Delta\lambda_1$ may be expected to be approximately $+1''\cdot6$ and $+5''$ respectively.

EQUINOXES

The **vernal equinox**, or **first point of Aries**, is defined as that intersection of the equator and ecliptic through which the Sun passes when crossing the equator from south to north. On account of the movements of the equator and ecliptic the equinox is continually shifting. Its movement may be resolved into two portions, one of which, known as **precession**, causes the equinox to retrograde along the ecliptic or equator at a nearly uniform rate, while the other, known as **nutation**, causes a periodic displacement of the equinox from the position that it would have if affected by precession alone. When the effect of nutation is removed the resulting fictitious equinox is called the **mean equinox**. Its instantaneous position at any moment of time is the **mean equinox of date**, while its position at the beginning of the Besselian fictitious year is known as the **mean equinox of the beginning of the year**, or, more briefly, for the year 1935, the **equinox of 1935.0**. The intersection of the true equator and ecliptic is the **true or apparent equinox**.

The Besselian fictitious year, sometimes known as the solar year, is used in astronomy because of the incommensurability of the calendar and tropical years. Its length is the tropical year of $365^d\cdot24219879 - 0^d\cdot00000614T$, where T is measured in centuries from 1900, and the beginning, which is always near the beginning of the calendar year, is defined as the moment when the right ascension of the mean sun, affected by aberration and measured from the mean equinox, is $18^h\ 40^m$. A definition that is equivalent (except for a small term in T^2 , as is explained on page 785) is that it is the moment when the Sun's mean longitude, affected by aberration, is 280° . The mean longitude tabulated on page 54 and defined on page 784 is freed from aberration; since Newcomb used $20''\cdot50$ as the constant of aberration, we may conveniently determine the beginning of the Besselian fictitious year as the moment when the Sun's mean longitude, freed from aberration, is $280^\circ\cdot0057$. The notation 1900.0, which is used to denote the beginning of the Besselian fictitious year 1900, should never be used to denote an epoch like 1900 January 0, Greenwich mean noon.

Since nutation arises from the action of the Sun and Moon on the Earth, it does not affect the position of the ecliptic, but only that of the equator, and consequently nutation does not affect the latitudes of heavenly bodies. The ecliptic is, however, not fixed in space, but changes its position slowly on account of the action of the other planets on the Earth's orbit. Since the ecliptic is the fundamental plane to which other planes in the solar system are referred, the ecliptic of any one date must be referred to the position of the mean ecliptic of some specified date. The ascending node of the ecliptic of the instant $t + dt$ on the ecliptic of the instant

t is the quantity denoted in these pages by Π (approximately 174°), while the annual change in the inclination of the moving ecliptic to its fixed position at some instant is π (approximately $0''.471$). The term true ecliptic, which would denote the instantaneous orbit of the Earth round the Sun, is not used.

The inclination of the ecliptic to the equator, known as the **obliquity** of the ecliptic, varies on account of the combined movements of these two planes, and, as we have just seen, the movement of the equator is affected by nutation, so that we introduce the idea of a mean equator, and hence of a mean obliquity, a mean obliquity of date, a mean obliquity for the beginning of the year, and a true or apparent obliquity, as in the case of the equinox. The difference true obliquity minus mean obliquity of date is the **nutation in obliquity**. The **nutation in longitude** is the arc of the ecliptic intercepted between the mean and the true equators, and is given in the sense in which such quantities are usually given in astronomy, i.e. as the correction to be added to a mean longitude to give apparent longitude. The **nutation in right ascension** will be equal to the nutation in longitude multiplied by the cosine of the obliquity, and reduced to time. The apparent obliquity and the nutation in obliquity are no longer tabulated directly in the *Nautical Almanac*, but may be readily obtained as follows:—

Mean obliquity for beginning of the year, see page 54

Reduction to mean obliquity of date = $-0''.468 \tau$

Nutation in obliquity, long-period terms = $-B$ (pages 266-273)

Nutation in obliquity, short-period terms = $-B'$ (pages 266-273)

It has been the practice to refer the solar, lunar, planetary and stellar ephemerides to the apparent equinox, so that they may be compared directly with observations. But in theoretical work, and in the intercomparison of observations, it is generally necessary to employ some fixed equinox. In this connection use is made of the mean equinox of the beginning of the year in such work as the determination of cometary orbits, and as an intermediate stage in the reduction of observations of stars to a form in which they can be combined. In the computation of perturbations of comets and minor planets, and in the combination of observations of star positions into a single catalogue, it is necessary to go a stage further, and to adopt a few widely separated equinoxes. The equinox of 1950.0 has been suggested* as a standard equinox for the next fifty years or so. The Sun's longitude, latitude and equatorial rectangular co-ordinates are now given in each *Almanac* for that equinox. In the case of the planets, instead of publishing year by year the co-ordinates for the equinox of 1950.0, they will be issued in separate volumes, each covering twenty years. The volume† for the years 1920-1939 was published in 1933, and is described on page 777. It is anticipated that the volume for 1940-1960 will be published in 1939.

The ephemerides of minor planets, published by the Astronomisches Rechen-Institut of Berlin, are now for the equinox of 1925.0, but will shortly be changed to that of 1950.0. The steps taken by the national ephemerides to facilitate the adoption of the equinox of 1950.0 as a standard formed the subject of a special

* L. J. Comrie, "The Use of a Standard Equinox in Astronomy." *M.N.R.A.S.*, 86, 618 (1926 June).

† *Planetary Co-ordinates for the years 1800-1940, referred to the Equinox of 1950.0*. London, H. M. Stationery Office, 1933. 12s. 6d. net.

resolution of approval at the meeting of the International Astronomical Union* at Leiden in 1928 July.

The position of a star, when referred to a specified mean equinox, is spoken of as the **mean position** for that equinox. In some cases the position is said to be for a certain equinox, but for a different **epoch**; this means that, when reducing to the specified equinox the position observed at the epoch, no correction for proper motion has been applied. Or, on the other hand, the position may have been taken from a catalogue, and a correction for proper motion deliberately applied so that the position of the star, in so far as proper motion is concerned, is that appropriate to the epoch, whereas the axes of reference are those of the equinox specified. In mean positions of stars the effect of stellar aberration has always been removed.

The **apparent position** of a heavenly body is the position in which it would be seen by an observer, i.e. it has been corrected for precession and nutation, so that it is referred to the true equator and equinox of 'date'; it has been corrected for stellar aberration, or, in the case of a body in the solar system, for planetary aberration; also it has been corrected for proper motion and, if necessary, for parallax. In the *Nautical Almanac* the apparent positions of stars are corrected for annual parallax where this is known and is sensible. The ephemerides of the members of the solar system are geocentric, so that no correction for horizontal parallax requires to be included.

STANDARD EQUINOX OF 1950.0

The volume* *Planetary Co-ordinates for the Years 1800–1940, referred to the Equinox of 1950.0*, together with quantities now given in the *Nautical Almanac*, enable this equinox to be used for all purposes for which a fixed equinox is desirable. The volume contains values of the heliocentric longitude, latitude, radius vector and equatorial rectangular co-ordinates, and of the equatorial rectangular components of the attraction of the planet on the Sun. For the years 1920–1939, Venus, Mars and Jupiter are given at intervals of 10 days, Saturn at 20, Uranus and Neptune at 40. For the years 1900–1920 Jupiter and Saturn are given at intervals of 40 days, while for 1903–1920 Uranus and Neptune are given at intervals of 160 days. For 1800–1900 heliocentric spherical co-ordinates of Jupiter and Saturn are given at intervals of 100 days. The volume also gives tables of the mean obliquity and its trigonometrical functions, ecliptic and equatorial precessional elements, tables for reduction of equatorial rectangular co-ordinates from any equinox to 1950.0 or vice versa, tables for reduction of star positions from the equinoxes of 1875.0, 1900.0 and 1925.0 to that of 1950.0 and vice versa, $\frac{1}{3}$ with argument r^2 , Encke's f_q table in natural form, masses, and collected formulæ. The calculation of the special perturbations of a comet or of a minor planet by Encke's and by Cowell's method is described and illustrated.

The *Nautical Almanac* itself provides

- (1) Sun's co-ordinates, both spherical and rectangular, for the equinox of 1950.0. (Pages 38–53).
- (2) Precessional constants. (Page 54).

* London, H. M. Stationery Office, 1933. 12s. 6d. net.

- (3) Quantities for the application of differential precession, nutation and aberration. (Pages 275-295).
- (4) Tables for the rigorous reduction of star positions from the equinox of the beginning of the year to that of 1950.0. (Tables XIII and XIV).
- (5) Tables for reducing a finding ephemeris from the standard equinox of 1950.0 to the true equinox of date. (Table XV).

LONG-PERIOD AND SHORT-PERIOD TERMS

It has been the practice to divide the terms of nutation into long-period terms, which do not depend on the Moon's longitude, and short-period terms, which do. The reasons for this were firstly, that the short-period terms are small, being usually negligible in comparison with the probable error of a single observation, so that no systematic error is caused by their neglect. Secondly, the apparent places of stars are usually given at intervals of ten days, and the short-period terms cannot be interpolated at such wide intervals; consequently they are omitted, but means are provided for their inclusion when desired. The increased accuracy now attainable in meridian circle observations is resulting in the more frequent inclusion of these terms, especially in accurate time-keeping and longitude determination. No theoretical reason exists for the separation or exclusion of short-period terms; the treatment adopted has been solely a matter of convenience.

In the ephemerides of the Sun, Moon and planets short-period terms are omitted, and it is contemplated that this practice will continue for some years at least; as already remarked no systematic error is thereby introduced into the comparison of observation with theory. In any case the further corrections necessary could readily be computed from the functions tabulated on pages 275-289 by the formulæ

$$\begin{aligned}\Delta\alpha &= f' + \frac{1}{18}g' \sin(G' + \alpha) \tan \delta \\ \Delta\delta &= g' \cos(G' + \alpha)\end{aligned}$$

The corrections to the apparent places of the stars on pages 358-520 are more conveniently expressed in the form

$$\begin{aligned}\Delta\alpha &= A'a + B'b \\ \Delta\delta &= A'a' + B'b'\end{aligned}$$

A' and B' being given on pages 266-273, and a , a' , b and b' being tabulated for each star.

It must be noted that these terms are already included in the ephemerides of circumpolar stars on pages 308-357.

UNIT OF DISTANCE

The unit of distance in the solar system is the mean distance of the Earth from the Sun. Using Hayford's value of 3963.34 miles for the Earth's equatorial radius, and the adopted value of $8''.80$ for the Sun's equatorial horizontal parallax, this distance is 92,900,000 miles or 149,500,000 kilometres, the logarithms of which may be taken as 7.9680 and 8.1746 respectively.

THE NAUTICAL ALMANAC

In the *Nautical Almanac* for 1931, under the heading DERIVATION (pages 802-827), the calculation of many of the quantities tabulated was illustrated in full.

The lists of mathematical tables given in the *British Astronomical Association Handbook* for 1929, and in the *Monthly Notices of the Royal Astronomical Society*, 92, 338 (1932 February), include most of the tables used in compiling the *Almanac*. The calculating machines in use are Burroughs, Hollerith, Mercedes, Monroe, National (Ellis) and Nova-Brunsviga. Descriptions of these machines, and of the work done with them, will be found in

- (1) "On the Application of the Brunsviga-Dupla Calculating Machine to Double Summation with Finite Differences." *M.N.R.A.S.*, 88, 447. (1928 March).
- (2) "On the Construction of Tables by Interpolation." *M.N.R.A.S.*, 88, 506. (1928 April).
- (3) "Recent Developments in Calculating Machines." *Office Machinery Users' Association Transactions*, 1927-28.
- (4) "Modern Babbage Machines." *Office Machinery Users' Association Transactions*, 1931-32.
- (5) "The Nautical Almanac Office Burroughs Machine." *M.N.R.A.S.*, 92, 523. (1932 April).
- (6) "The Application of the Hollerith Tabulating Machine to Brown's Tables of the Moon." *M.N.R.A.S.*, 92, 694. (1932 May).
- (7) "Computing the Nautical Almanac." *Nautical Magazine*, 1933 July.
- (8) "The Hollerith and Powers Tabulating Machines." Privately printed, 1933.

It is to be noted that in all cases, unless otherwise stated, or unless inconsistent with the headings of the page (e.g. Ephemerides at Transit at Greenwich) the quantities given are for ⁰_h G.M.T. on the dates concerned.

Calendar (Pages 1-5)

The special article on the calendar (page 754) and the explanation at the foot of page 2 may be consulted.

Sun (Pages 6-21)

The *Apparent Right Ascension* and *Apparent Declination* are referred to the true equinox of date and are affected by aberration and the long-period terms of nutation; they therefore represent the apparent position of the true Sun. They are computed from the Sun's longitude and latitude by the formulæ

$$\begin{aligned}\cos \delta_0 \cos \alpha_0 &= \cos \lambda \\ \cos \delta_0 \sin \alpha_0 &= \sin \lambda \cos \epsilon - 19.3 \beta \\ \sin \delta_0 &= \sin \lambda \sin \epsilon + 44.5 \beta\end{aligned}$$

where λ includes nutation, but not aberration, β is in seconds of arc and the numerical coefficients in units of the seventh decimal. The aberration, or correction to the Sun's position to allow for its motion during the time taken by light from the

Sun to reach the Earth, is based on the assumption that light travels unit distance in $498^s.38$ (corresponding to a constant of aberration of $20''.47$) and is, therefore,

$$\begin{aligned} & - \frac{498.38 R \times \text{motion in } 2^d}{60 \times 60 \times 24 \times 2} \\ & = -0.0028841 R \times \text{motion in } 2^d \end{aligned}$$

The motion in 2^d is obtained by subtracting α_0 (or δ_0) on the day before that for which the calculation is being made from the value on the day following. Theoretically the aberration could have been applied to λ , but it is excluded as the quantities on the right-hand side of the above equation are required when determining values of the Sun's rectangular equatorial co-ordinates X, Y, Z to be used in converting heliocentric positions of the planets to geocentric positions (see page 793). The quantities $\sin \lambda$ and $\cos \lambda$ are also required in forming the Besselian day numbers C and D (see page 795).

The *Semi-diameter* at unit distance is taken as $16' 01''.18$. A smaller value (see page 801) is used in the computation of eclipses. The tabulated value is the value at unit distance divided by the Sun's radius vector.

The *Equation of Time*, tabulated in the sense apparent *minus* mean, is the correction to be added to mean time to give apparent time. It is found from

$$\text{Sidereal Time at } 0^h \pm 12^h - \text{Sun's apparent R.A.}$$

The *Sidereal Time* is, at midnight, $12^h +$ the right ascension of the mean sun, affected by aberration, + nutation in right ascension. The short-period terms of nutation, whose combined effect may attain $\pm 0^s.020$, are included. Their effect may be removed by subtracting f' . See **uniform sidereal time** (page 774), **nutation in right ascension** (page 781), Table III (page 718) and explanation of Table III (page 849).

The use of the sidereal time at 0^h in converting a given mean time into sidereal time is illustrated in Table III, page 718. The right ascension of the mean sun, affected by aberration, is, according to Newcomb

$$18^h 38^m 45^s.836 + 8640184^s.542 T + 0^s.0929 T^2$$

where T is measured in Julian centuries of 36525 days from 1900 January $0^d 0^h$ (J.D. 2415020.0).

The *Sun's Longitude and Latitude*, which are taken from Newcomb's *Tables of the Sun*, are referred to the mean equinox of the beginning of the year. The apparent longitude is equal to the longitude referred to the mean equinox of the beginning of the year + precession in longitude + nutation in longitude - aberration. The apparent latitude is equal to the mean latitude - $0''.471 \tau \sin(\lambda - \Pi)$, τ being given on pages 275-289, and Π on page 54.

The *Radius Vector of the Earth* is the distance from the centre of the Sun to the centre of the Earth, measured in astronomical units. It is taken from Newcomb's *Tables*, and is independent of the equinox. Natural values are given on pages 38-45.

The *Precession in Longitude* is the precession since the beginning of the Besselian fictitious year for a point on the ecliptic, and is equal to $p\tau$. For other points the further correction $+0''.471 \tau \cos(\lambda - \Pi) \tan \beta$ must be applied.

The *Nutation in Longitude*, which does not include short-period terms, is the correction to be added to a longitude referred to the mean equinox of date to give the longitude referred to the true equinox of date, which, when aberration has been

subtracted, becomes the apparent longitude. It is independent of the latitude. The short-period terms are $+50''\cdot37 A'$. The terms included are

$$\begin{aligned} & -(17\cdot234 + 0\cdot017 T) \sin \Omega \\ & + 0\cdot209 \sin 2\Omega \\ & - 1\cdot272 \sin 2L \\ & + 0\cdot126 \sin(L - \Gamma) \\ & - 0\cdot050 \sin(3L - \Gamma) \\ & + 0\cdot021 \sin(L + \Gamma) \\ & + 0\cdot012 \sin(2L - \Omega) \end{aligned}$$

The *Nutation in Right Ascension*, which includes short-period terms, is tabulated for use in connection with accurate time-keeping, as explained in the article on time (page 771). It is the correction to be added to the right ascension of a body in the equator (e.g. the mean sun) to reduce from the mean equinox of date to the true equinox of date. The effect of the short-period terms may be removed, if desired, by subtracting f' . The formulæ used are

$$\text{Long-period terms} = \frac{1}{18} \Delta\psi \cos \epsilon$$

$$\text{Short-period terms} = f' = \frac{1}{18} d\psi \cos \epsilon = mA'$$

where $\Delta\psi$ and $d\psi$ are the long-period and short-period terms respectively of the nutation in longitude.

For star reductions nutation is combined with precession, and computed by means of the Besselian or the independent day numbers.

The *Transit of the First Point of Aries* is the mean time of sidereal 0^h , or the moment when the true equinox is on the meridian. It is computed as the mean time equivalent of $(24^h - \text{sidereal time at } 0^h)$; this formula neglects the change in nutation from 0^h till the time of transit, and thus may be in error by $0^s\cdot004$. The effect of short-period terms, which may attain $\pm 0^s\cdot020$, is not included. Its use in converting a given sidereal time into mean time is illustrated in Table IV, page 719.

Sun at Transit at Greenwich (Pages 22-29)

These pages give the Greenwich mean time, together with the apparent right ascension, apparent declination, and semi-diameters of the Sun at apparent noon at Greenwich. A transit ephemeris for any other longitude can be readily made by interpolation, the interpolated G.M.T. becoming the local mean time of transit.

The G.M.T. of transit, i.e. apparent noon, is

$$12^h - \text{equation of time, interpolated to apparent noon.}$$

As the quantity we are seeking is involved in the equation by which it is defined, successive approximations are necessary. Actually, however, it suffices to interpolate the equation of time to the time of apparent noon four years previously, as this time is always within 3^s of the truth for the year under consideration. Hence, if F is the fraction of the day between 0^h and apparent noon, using the value of F as determined four years previously

$$\text{E.T. at apparent noon} = \text{E.T. at } 0^h + F\Delta' - 0\cdot0625(\Delta_0'' + \Delta_1'')$$

From this value of the equation of time F is computed accurately, and then

$$\alpha = \alpha \text{ at } 0^h + F\Delta' - 0\cdot0625(\Delta_0'' + \Delta_1'')$$

$$\delta = \delta \text{ at } 0^h + F\Delta' - 0\cdot0625(\Delta_0'' + \Delta_1'')$$

The semi-diameter in arc is taken as being half-way between the midnight values. The semi-diameter in seconds of sidereal time, or the sidereal time required for the semi-diameter to pass the meridian, is

$$\frac{\text{S. D. in arc} \times \sec \delta \times 86636.555}{15 \times (86636.555 - \Delta\alpha)}$$

$$= \text{S. D. in arc} \times \sec \delta \times S$$

where $\Delta\alpha$ is strictly the daily variation of α at the moment of transit, but may be taken as the first difference of the values of α at 0^h. 86636.555 is the number of sidereal seconds in one mean solar day. The factor S has been tabulated in the form of a short critical table with argument $\Delta\alpha$.

Sun's Co-ordinates (Pages 30-37 and 46-53)

The *Sun's Equatorial Rectangular Co-ordinates* are given for every midnight, together with their first and second differences.

The axis of X is directed to the first point of Aries, the axis of Y to the point in the equator whose R.A. is 6^h, and the axis of Z to the north pole of the equator.

The co-ordinates on pages 30-37 are referred to the mean equator and equinox of the beginning of the current year. The reduction to the true equinox of date is not given, as co-ordinates referred to that equinox are no longer in use. These co-ordinates will not be published in the *Almanacs* for 1938 and subsequent years, but the co-ordinates referred to the equinox of 1950.0 will be retained. Attention is drawn to the use of the Everett coefficients on pages 747-748 for interpolating these co-ordinates.

$$X = R \cos \lambda$$

$$Y = R (\sin \lambda \cos \epsilon - \sin \beta \sin \epsilon)$$

$$Z = R (\sin \lambda \sin \epsilon + \sin \beta \cos \epsilon)$$

Replacing $\sin \beta$ by $\beta \sin 1''$ (β being in seconds) and expressing $\sin \epsilon \sin 1''$ and $\cos \epsilon \sin 1''$ in units of the seventh decimal,

$$X = R \cos \lambda$$

$$Y = R (\sin \lambda \cos \epsilon - 19.3 \beta)$$

$$Z = R (\sin \lambda \sin \epsilon + 44.5 \beta)$$

Co-ordinates referred to the equinox of any year may be reduced to the equinox of the following year by

$$\Delta X = -0.000\ 2235\ Y - 0.000\ 0972\ Z$$

$$\Delta Y = +0.000\ 2235\ X$$

$$\Delta Z = +0.000\ 0972\ X$$

The constants A_x , B_x , etc. (see *Planetary Co-ordinates*, page 154) in

$$x = A_x (\cos E - e) + B_x \sin E \text{ etc.}$$

may be reduced by the same coefficients. For reduction from the equinox of any year to that of the preceding year, the signs of the above corrections must be reversed.

The co-ordinates may be reduced to other equinoxes by the formulæ

$$X = X_0 X_0 + Y_0 Y_0 + Z_0 Z_0$$

$$Y = X_0 X_0 + Y_0 Y_0 + Z_0 Z_0$$

$$Z = X_0 X_0 + Y_0 Y_0 + Z_0 Z_0$$

where X_0 , Y_0 , Z_0 are the values at the initial epoch, and X , Y , Z the values at the final epoch.

$$\begin{aligned}
 X_z &= \cos \zeta_0 \cos z \cos \theta - \sin \zeta_0 \sin z \\
 Y_z &= -\cos \zeta_0 \sin z - \sin \zeta_0 \cos z \cos \theta \\
 Z_z &= -\cos z \sin \theta \\
 X_y &= \sin \zeta_0 \cos z + \cos \zeta_0 \sin z \cos \theta \\
 Y_y &= \cos \zeta_0 \cos z - \sin \zeta_0 \sin z \cos \theta \\
 Z_y &= -\sin z \sin \theta \\
 X_x &= \cos \zeta_0 \sin \theta \\
 Y_x &= -\sin \zeta_0 \sin \theta \\
 Z_x &= \cos \theta
 \end{aligned}$$

For definitions of ζ_0 , z and θ see page 786. The numerical values for reduction from the equinox of 1950.0 to the equinoxes of 1900.0, 1925.0, 1975.0 and 2000.0 yield the following series in which T is reckoned in tropical centuries from 1950.0.

$$\begin{aligned}
 X_z &= 1.0000\ 0000 - 0.0002\ 9696\ T^2 - 0.0000\ 0014\ T^3 \\
 Y_z &= -X_y = -0.0223\ 4941\ T - 0.0000\ 0676\ T^2 + 0.0000\ 0221\ T^3 \\
 Z_z &= -X_x = -0.0097\ 1691\ T + 0.0000\ 0206\ T^2 + 0.0000\ 0098\ T^3 \\
 Y_y &= 1.0000\ 0000 - 0.0002\ 4975\ T^2 - 0.0000\ 0015\ T^3 \\
 Y_x &= Z_y = -0.0001\ 0858\ T^2 \\
 Z_x &= 1.0000\ 0000 - 0.0000\ 4721\ T^2 + 0.0000\ 0002\ T^3
 \end{aligned}$$

The transformation formulæ may also be written

$$\begin{pmatrix} X \\ Y \\ Z \end{pmatrix} = \begin{pmatrix} X_0 \\ Y_0 \\ Z_0 \end{pmatrix} \begin{pmatrix} X_x & X_y & X_z \\ Y_x & Y_y & Y_z \\ Z_x & Z_y & Z_z \end{pmatrix}$$

in which the multiplications are to be made column by column. The numerical values for 1900–1940 are given in *Planetary Co-ordinates*, Table V, page 107; values for certain special cases are

$$\begin{aligned}
 \begin{pmatrix} X_{1900} \\ Y_{1900} \\ Z_{1900} \end{pmatrix} &= \begin{pmatrix} X_{1950} \\ Y_{1950} \\ Z_{1950} \end{pmatrix} \begin{pmatrix} +0.9999\ 2578 & -0.0111\ 7274 & -0.0048\ 5885 \\ +0.0111\ 7274 & +0.9999\ 3758 & -0.0000\ 2714 \\ +0.0048\ 5885 & -0.0000\ 2714 & +0.9999\ 8820 \end{pmatrix} \\
 \begin{pmatrix} X_{1925} \\ Y_{1925} \\ Z_{1925} \end{pmatrix} &= \begin{pmatrix} X_{1950} \\ Y_{1950} \\ Z_{1950} \end{pmatrix} \begin{pmatrix} +0.9999\ 8144 & -0.0055\ 8690 & -0.0024\ 2934 \\ +0.0055\ 8690 & +0.9999\ 8439 & -0.0000\ 0679 \\ +0.0024\ 2934 & -0.0000\ 0679 & +0.9999\ 9705 \end{pmatrix} \\
 \begin{pmatrix} X_{1930} \\ Y_{1930} \\ Z_{1930} \end{pmatrix} &= \begin{pmatrix} X_{1950} \\ Y_{1950} \\ Z_{1950} \end{pmatrix} \begin{pmatrix} +0.9999\ 8812 & -0.0044\ 6959 & -0.0019\ 4346 \\ +0.0044\ 6959 & +0.9999\ 9001 & -0.0000\ 0434 \\ +0.0019\ 4346 & -0.0000\ 0434 & +0.9999\ 9811 \end{pmatrix} \\
 \begin{pmatrix} X_{1935} \\ Y_{1935} \\ Z_{1935} \end{pmatrix} &= \begin{pmatrix} X_{1950} \\ Y_{1950} \\ Z_{1950} \end{pmatrix} \begin{pmatrix} +0.9999\ 9332 & -0.0033\ 5225 & -0.0014\ 5758 \\ +0.0033\ 5225 & +0.9999\ 9438 & -0.0000\ 0244 \\ +0.0014\ 5758 & -0.0000\ 0244 & +0.9999\ 9894 \end{pmatrix}
 \end{aligned}$$

The values for reduction from the equinox of 1950.0 to that of any other year may also be used for reduction to the equinox of 1950.0 with the following formula

$$\begin{pmatrix} X_{1950} \\ Y_{1950} \\ Z_{1950} \end{pmatrix} = \begin{pmatrix} X_0 \\ Y_0 \\ Z_0 \end{pmatrix} \begin{pmatrix} +X_x & -X_y & -X_z \\ -Y_x & +Y_y & +Y_z \\ -Z_x & +Z_y & +Z_z \end{pmatrix} = \begin{pmatrix} X_0 \\ Y_0 \\ Z_0 \end{pmatrix} \begin{pmatrix} X_x & Y_x & Z_x \\ X_y & Y_y & Z_y \\ X_z & Y_z & Z_z \end{pmatrix}$$

in which X_0 , Y_0 and Z_0 are, as above, the known values at the initial epoch.

The same numerical coefficients may be used for the reduction of A_x , B_x , etc.

Sun, referred to Mean Equinox of 1950.0 (Pages 38–45)

The Sun's *Longitude and Latitude* are given both in degrees and decimals of a degree and in degrees, minutes and seconds.

The natural value of the *Radius Vector* given here corresponds to the logarithmic value on pages 7-21; it is, of course, independent of the equinox.

The longitude is obtained by adding to the longitude for the mean equinox of 1935.0 the quantity a on page 54. The latitude for the mean ecliptic of 1935.0 is reduced to the mean ecliptic of 1950.0 by the addition of $b \sin(\lambda_0 + c)$, where λ_0 is the longitude for 1935.0, and b and c are given on page 54.

For the correction to the Sun's co-ordinates depending on an assumed correction to the mean longitude, see page 775.

Sun (Page 54)

The *Horizontal Parallax* is the angle subtended at the Sun by the Earth's equatorial radius. The adopted value at unit distance is $8''.80$, so that the tabulated value is $8''.80 \div R$.

The *Aberration* is the movement in longitude of the Sun during the time taken by light to reach the Earth from the Sun. The apparent longitude is always less than the true geometrical longitude by the amount of the aberration, because the position in which an observer sees the Sun is that which it really occupied about 8^m earlier, when the observed light left the Sun. The adopted constant of aberration is $20''.47$, and the value tabulated is $20''.47 \div R$.

The *Elements of the Sun*, as given by Newcomb in his *Tables of the Sun*, are

$$\begin{aligned} \text{Epoch 1900 January 0.0 G.M.T.} &= \text{J.D. } 2415020.0 \\ L &= 279^\circ 41' 48''.04 + 129602768''.13 T + 1''.089 T^2 \\ &= 279^\circ 49' 66.68 + 0^\circ 9856473354 d + 0^\circ 000302 T^2 \\ \pi^* &= 281^\circ 13' 15''.0 + 6189''.03 T + 1''.63 T^2 + 0''.012 T^3 \\ &= 281^\circ 22' 08.3 + 0^\circ 0000470684 d + 0^\circ 000453 T^2 + 0^\circ 000003 T^3 \\ g &= L - \pi = 358^\circ 28' 33''.0 + 129596579''.10 T - 0''.54 T^2 - 0''.012 T^3 \\ &= 358^\circ 47' 58.3 + 0^\circ 9856002670 d - 0^\circ 000150 T^2 - 0^\circ 000003 T^3 \\ e &= 0.01675104 - 0.00004180 T - 0.000000126 T^2 \\ \epsilon &= 23^\circ 27' 08''.26 - 46''.845 T - 0''.0059 T^2 + 0''.00181 T^3 \\ &= 23^\circ 45' 22.94 - 0^\circ 0130125 T - 0^\circ 00000164 T^2 + 0^\circ 000000503 T^3 \end{aligned}$$

where T is measured in Julian centuries of 36525 days, and d in days. The mean longitude L is measured from the mean equinox of date. The right ascension of the mean sun is given on page 780.

From the above mean motions the lengths of the three principal years are

$$\begin{array}{lll} \text{Tropical} & \dots & 365^\circ 242' 19.879 - 0.00000614 T \\ \text{Sidereal} & \dots & 365^\circ 256' 36.042 + 0.00000011 T \\ \text{Anomalistic} & \dots & 365^\circ 259' 64.134 + 0.00000304 T \end{array}$$

The logarithm of the mean distance a as computed by the expression

$$a^3 n^2 = k^2 (1 + m)$$

where

$$\begin{aligned} n &= \text{mean daily motion of the Sun} \\ k &= \text{Gaussian gravitational constant} \\ &= 0.01720209895 = 3548''.18761 \\ m &= \text{mass of Earth} + \text{Moon} = 1 \div 329390 \end{aligned}$$

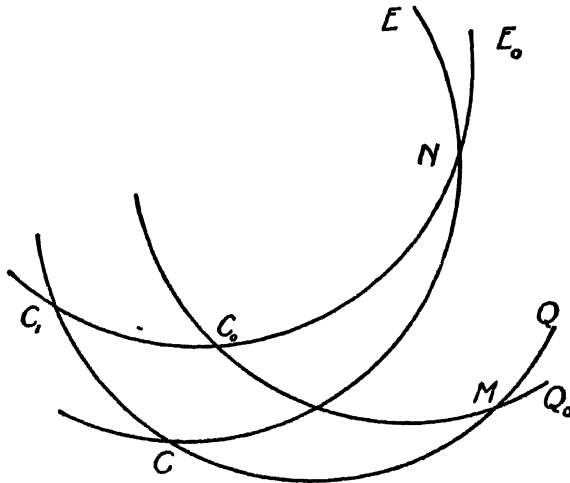
* The notation used here is that of Newcomb's *Tables*; elsewhere in this *Almanac* the mean longitude of the Sun's perigee is denoted by Γ .

is 0.000000013, to which have been added corrections due to the action of the planets, so that the value adopted in the tables is 0.00000010.

The existence of a term in T^2 in the right ascension of the mean sun may cause surprise, when it is remembered that the mean sun is defined as having a *uniform* motion in the equator. Actually the motion is uniform, but in the expression of its numerical value it is measured from the mean equinox, which has a secular or T^2 term. Hence the linear or T term of the right ascension of the mean sun agrees with that of the mean longitude of the true Sun, while the secular term of the right ascension of the mean sun is that of the mean equinox, and differs by $0''.305 T^2$ or $0^s.0203 T^2$ from that of the mean longitude of the true Sun. Speaking of this, Newcomb, in his *Astronomical Constants*, page 188, says "This difference is of no importance in the astronomy of our time, but may result in an error of 2^s in the course of 1000 years in the measurement of time by the actual mean sun. We must leave to the astronomers of the future the question how best to meet the question thus arising."

Precessional Constants (Page 54)

The geometrical significance of the various constants may be understood by reference to the diagram, in which Q_0 , E_0 and C_0 represent the equator, ecliptic and equinox at some initial epoch t_0 , and Q , E and C at the epoch t . M is the node of the two equators, and N that of the two ecliptics, these nodes being the ascending ones if $t - t_0$ is positive. C_1 is the intersection of the initial ecliptic and the equator of date.



$$\epsilon_0 = E_0 C_0 Q_0 \quad \epsilon = ECQ \quad \epsilon_1 = E_0 C_1 Q$$

If the interval between the two epochs is one year

$$\psi = \text{luni-solar precession} = C_1 C_0$$

$$\lambda = \text{planetary precession on the equator} = C_1 C$$

$$p = \text{general precession in longitude} = CN - C_0 N = \psi - \lambda \cos \epsilon_1$$

$$m = \text{general precession in R.A.} = CM - C_0 M = \psi \cos \epsilon_1 - \lambda$$

$$n = \text{precession in declination} = C_0 MC$$

$$\pi = \text{inclination of moving ecliptic to fixed ecliptic} = C_0 NC = \text{speed of rotation of ecliptic}$$

If the interval between the two epochs is $t - t_0$ years

Π = ascending node of moving ecliptic on fixed ecliptic = C_0N

$\zeta_0 = 90^\circ - C_0M$ $\zeta = 90^\circ - C_1M$ $z = CM - 90^\circ$

θ = inclination of moving equator to fixed equator = C_0MC

M = general precession in R.A. = $CM - C_0M = \zeta_0 + z = \bar{m} (t - t_0)$

N = precession in declination = $C_0MC = \theta = \bar{n} (t - t_0)$

a = general precession in longitude = $CN - C_0N = \bar{p} (t - t_0)$

b = inclination of moving ecliptic to fixed ecliptic = $C_0NC = \bar{\pi} (t - t_0)$

$c = 180^\circ - \Pi + \frac{1}{2}a$

The following values are given by Newcomb, T being measured in tropical centuries from 1900.0:—

$$\begin{aligned}\text{Annual luni-solar precession} &= \psi = 50''.3708 + 0''.0050 T \\ \text{Annual planetary precession on equator} &= \lambda = 0''.1248 - 0''.0188 T \\ \text{Annual general precession} &= p = 50''.2564 + 0''.0222 T \\ \text{Annual precession in R.A.} &= m = 3''.07234 + 0''.00186 T \\ \text{Annual precession in Dec.} &= n = 20''.0468 - 0''.0085 T \\ &= 1''.33646 - 0''.00057 T\end{aligned}$$

$$\text{Obliquity} = \epsilon = 23^\circ 27' 08''.26 - 46''.845 T - 0''.0059 T^2 + 0''.00181 T^3$$

$$\Pi = 173^\circ 57'.06 + 54'.77 T$$

$$\pi = 0''.4711 - 0''.0007 T$$

$$\zeta_0 = 2304.25 T + 0.30 T^2 + 0.018 T^3$$

$$z = 2304.25 T + 1.09 T^2 + 0.019 T^3$$

$$\theta = 2004.68 T - 0.43 T^2 - 0.041 T^3$$

The values of ϵ , p , m , n , Π and π on page 54 are derived from the above formulæ by putting $T = 0.35$.

The formulæ used for the quantities ζ_0 , z and θ , for reduction from the equinox of 1950.0 to the mean equinox of other years are

$$\zeta_0 = 2304.948 T + 0.302 T^2 + 0.0179 T^3$$

$$z = 2304.948 T + 1.093 T^2 + 0.0192 T^3$$

$$\theta = 2004.255 T - 0.426 T^2 - 0.0416 T^3$$

where T is measured from 1950.0 in tropical centuries. For reduction to the equinox of 1950.0, ζ_0 must be replaced by $-\zeta$, z by $-\zeta_0$ and θ by $-\theta$.

The formulæ for M , N , a , b and c are:—

For reduction from the equinox of t to that of 1950.0

$$M = \zeta_0 + z = \bar{m} (1950.0 - t)$$

$$N = \theta = \bar{n} (1950.0 - t)$$

$$a = \bar{p} (1950.0 - t)$$

$$b = \bar{\pi} (1950.0 - t)$$

$$c = 180^\circ - \Pi + \frac{1}{2}a$$

and for reduction from the equinox of 1950.0 to that of t

$$M = \zeta_0 + z = \bar{m} (t - 1950.0)$$

$$N = \theta = \bar{n} (t - 1950.0)$$

$$a = \bar{p} (t - 1950.0)$$

$$b = \bar{\pi} (t - 1950.0)$$

$$c = 180^\circ - \Pi - \frac{1}{2}a$$

where \bar{m} , \bar{n} , \bar{p} , $\bar{\pi}$ and $\bar{\Pi}$ are the values of m , n , p , π and Π at the epoch half-way between 1950.0 and t .

Values of the precessional elements for the years 1800–1950 are given in Tables I–IV of *Planetary Co-ordinates*.

For reduction from the equinox of any year to that of the succeeding year, the following simplified formulæ may be used

$$\begin{aligned}\Delta\lambda &= +50''.27 - 0''.47 \cos(\lambda + 6^\circ) \tan \beta \\ \Delta\beta &= +0''.47 \sin(\lambda + 6^\circ) \\ \Delta\alpha &= +38''.073 + 1''.336 \sin \alpha \tan \delta \\ \Delta\delta &= +20''.04 \cos \alpha \\ \Delta\Omega &= +50''.27 - 0''.47 \sin(\Omega + 6^\circ) \cot i \\ &= +0''.01396 - 0''.00013 \sin(\Omega + 6^\circ) \cot i \\ \Delta i &= +0''.47 \cos(\Omega + 6^\circ) = +0''.00013 \cos(\Omega + 6^\circ) \\ \Delta\omega &= +0''.47 \sin(\Omega + 6^\circ) \operatorname{cosec} i \\ &= +0''.00013 \sin(\Omega + 6^\circ) \operatorname{cosec} i\end{aligned}$$

For reduction from the equinox of any year to that of the preceding year, the signs of the above corrections must be reversed.

The formulæ for the rigorous reduction of star positions from one epoch to another are

α_0 , δ_0 = R.A. and Dec. for equinox t_0 and epoch t , i.e. the proper motion for the interval $t - t_0$ is *first* applied

$$\begin{aligned}a &= \alpha_0 + \zeta_0 \\ \cos \delta \sin a' &= \cos \delta_0 \sin a \\ \cos \delta \cos a' &= \cos \theta \cos \delta_0 \cos a - \sin \theta \sin \delta_0 \\ \sin \delta &= \sin \theta \cos \delta_0 \cos a + \cos \theta \sin \delta_0 \\ a &= a' + z\end{aligned}$$

or, if the star is not too near the pole

$$\begin{aligned}a &= \alpha_0 + \zeta_0 \\ p &= \sin \theta (\tan \delta_0 + \tan \frac{1}{2}\theta \cos a) \\ \tan(a' - a) &= \frac{p \sin a}{1 - p \cos a} \\ a &= a + (a' - a) + z = \alpha_0 + (a' - a) + M \\ \tan \frac{1}{2}(\delta - \delta_0) &= \frac{\cos \frac{1}{2}(a' + a)}{\cos \frac{1}{2}(a' - a)} \tan \frac{1}{2}\theta\end{aligned}$$

The formulæ at the foot of page 54 for reducing right ascension and declination may be used if an approximate precession is known to determine $\bar{\alpha}$ and $\bar{\delta}$. Another rigorous form of reduction, intended for use when accurate precessions and secular variations are not available, is given in Tables XIII and XIV, pages 730–734.

The formulæ on page 54, for the reduction of longitude, latitude and orbital elements from 1935.0 to 1950.0 or vice versa, may be regarded as rigorous.

Moon's Mean Equator, Orbit and Mean Longitude (Page 55)

The quantities given are

- i = inclination of the Moon's mean equator to the Earth's true equator
- Δ = distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic

Ω' = distance in the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator

Γ' = mean longitude of the Moon's perigee measured in the ecliptic from the mean equinox to the mean ascending node of the Moon's orbit, and then in the Moon's orbit

Ω = longitude of the mean ascending node of the Moon's orbit on the ecliptic, measured from the mean equinox

ϵ = mean longitude of the Moon, measured in the ecliptic from the mean equinox to the mean ascending node of the Moon's orbit, and then in the Moon's orbit.

The ascending node of the Moon's equator on the ecliptic is also the descending node of the Moon's orbit on the ecliptic, i.e. $\Omega \pm 180^\circ$.

If

I = the constant inclination of the Moon's mean equator to the ecliptic
= $1^\circ 32' \cdot 1$ according to Hayn (page 819)

ϵ = true obliquity

N = nutation in longitude

then

$$\cos i = \cos I \cos \epsilon + \sin I \sin \epsilon \cos(\Omega + N)$$

$$\sin \Omega' = -\sin(\Omega + N) \operatorname{cosec} i \sin I$$

$$\sin \Delta = -\sin(\Omega + N) \operatorname{cosec} i \sin \epsilon$$

$$\text{or } \cos \Delta = -\cos(\Omega + N) \cos \Omega' - \sin(\Omega + N) \sin \Omega' \cos \epsilon$$

The quadrant of Δ is determined from the sign of $\sin \Delta$ or $\cos \Delta$, whichever is used, and the fact that Δ is always approximately $\Omega + N \pm 180^\circ$.

The fundamental elements in Brown's *Tables of the Motion of the Moon*, Section I, Chapter I, page 28, are

Epoch 1900 January 0.0 G.M.T. = J.D. 241 5020.0

$$\epsilon = 270^\circ 26' 11 \cdot 71 + 481267^\circ 53' 26 \cdot 06 T + 7 \cdot 14 T^2 + 0 \cdot 0068 T^3$$

$$\Gamma' = 334 19 46 \cdot 40 + 4069 02 02 \cdot 52 T - 37 \cdot 17 T^2 - 0 \cdot 045 T^3$$

$$\Omega = 259 10 59 \cdot 79 - 1934 08 31 \cdot 23 T + 7 \cdot 48 T^2 + 0 \cdot 008 T^3$$

$$e = \text{eccentricity} = 0 \cdot 054900489$$

$$\gamma = \sin \frac{1}{2} i = 0 \cdot 044886967$$

$$\text{Constant term in sine parallax} = 3422'' \cdot 5400$$

$$\text{Ratio of mass of Earth to mass of Moon} = 81 \cdot 53$$

In the above T is measured in Julian centuries of 36525 days. If d is measured in days from the epoch

$$\epsilon = 270^\circ 436586 + 13 \cdot 1763967302 d + 0 \cdot 001983 T^2 + 0 \cdot 0000019 T^3$$

$$\Gamma' = 334 \cdot 329556 + 0 \cdot 1114040803 d - 0 \cdot 010325 T^2 - 0 \cdot 000012 T^3$$

$$\Omega = 259 \cdot 183275 - 0 \cdot 0529539222 d + 0 \cdot 002078 T^2 + 0 \cdot 000002 T^3$$

Moon (Pages 56-71)

The Moon's *Longitude* and *Latitude* are taken from Brown's *Tables of the Motion of the Moon*, and are referred to the true ecliptic and equinox of date, but with the omission of the short-period terms of nutation in longitude. In these quantities no correction is made to Brown's *Tables*, but see also page 775 and under *Eclipses* and *Occultations*.

The Moon's *Horizontal Parallax*, or the angle subtended at the Moon's centre by the Earth's equatorial radius, is also taken from Brown's *Tables*.

The distance of the Moon is

$$\frac{\text{Earth's equatorial radius}}{\text{sine of Moon's horizontal parallax}}$$

which, using Hayford's value of 3963.34 miles for the Earth's equatorial radius, may be taken as

$$\text{Distance in miles} = \frac{817,535,000}{\text{H.P. in seconds of arc}}$$

The Moon's *Semi-diameter*, s , is derived from the horizontal parallax, π , by the relation

$$\frac{\sin s}{\sin 15' 32'' \cdot 58} = \frac{\sin \pi}{\sin 57' 02'' \cdot 70}$$

where $15' 32'' \cdot 58$ is the semi-diameter at mean distance as given by Newcomb and $57' 02'' \cdot 70$ is the mean equatorial horizontal parallax as given by Brown.

This leads to

$$\sin s = 0.272481 \sin \pi$$

or, with an error not exceeding $0''.001$,

$$s = 0''.079 + 0.272446 \pi$$

No correction is made for irradiation.

The Moon's *Age*, given for every midnight, is the number of days elapsed since the previous New Moon.

The times of the *Moon's Upper and Lower Transits over the Meridian of Greenwich* are given, and are for the centre of the Moon; interpolation to any given longitude will yield the local mean time of transit.

Moon's Right Ascension and Declination (Pages 72-163)

The *Moon's Right Ascension and Declination* are referred to the true equator and equinox, but with the omission of short-period terms of nutation.

The noon and midnight values are found from the longitude and latitude obtained from Brown's *Tables*. The formulæ for conversion are

$$\begin{aligned} \cos \delta \cos \alpha &= \cos \beta \cos \lambda \\ \cos \delta \sin \alpha &= \cos \beta (\sin \lambda \cos \epsilon - \tan \beta \sin \epsilon) \\ \sin \delta &= \cos \beta (\sin \lambda \sin \epsilon + \tan \beta \cos \epsilon) \end{aligned}$$

so that

$$\tan \alpha = \frac{\sin \lambda \cos \epsilon - \tan \beta \sin \epsilon}{\cos \lambda}$$

or

$$\cot \alpha = \frac{\cos \lambda}{\sin \lambda \cos \epsilon - \tan \beta \sin \epsilon}$$

It is convenient to determine $\tan \alpha$ or $\cot \alpha$, whichever is numerically less than 1.

The interpolation of the half-daily values to hourly values is done by the method described in Brown's *Tables*, Section I, Chapter VIII.

Phases of the Moon (Page 163)

The times of New Moon, First Quarter, Full Moon and Last Quarter are the Greenwich mean times when the excess of the Moon's longitude (pages 56-71) over the Sun's apparent longitude is 0° , 90° , 180° and 270° respectively. On account of the inclination of the Moon's orbit to the ecliptic the time of New Moon may differ slightly from the time of closest approach of the Sun and Moon.

The times of the Moon's *Perigee* and *Apogee* are the times when the Moon attains its least and greatest distances respectively from the Earth, i.e. when the horizontal parallax attains its maxima and minima respectively.

Moon at Transit at Greenwich (Pages 164-179)

This ephemeris, in common with other transit ephemerides, may be reduced to any other longitude by interpolation.

The column *Illuminated Limbs and Transit* shows the limbs, north or south, and I (preceding or west) or II (following or east), that are fully illuminated at the moment of transit at Greenwich. The indication for north or south limb is given only for upper transit at Greenwich, and is omitted when the transit occurs between 9^h and 15^h G.M.T., i.e. when the Moon is too close to the Sun for observation.

The *Apparent Geocentric Right Ascension of the Centre* may be reduced to the apparent right ascension of the limb by applying the quantity given in the next column.

The *Sidereal Time of Semi-diameter passing the Meridian* is the interval, in sidereal time, between the time of transit of the Moon's centre and the transit of the limb. Hence

$$\begin{aligned}\text{R.A. of Moon's centre} &= \text{R.A. of limb I} + \text{S.D. in time} \\ &= \text{R.A. of limb II} - \text{S.D. in time}.\end{aligned}$$

The *Apparent Geocentric Declination of the Centre* must be corrected for parallax before being compared with a meridian observation, or, alternatively, a correction $\Delta\delta$ must be applied to the observed declination δ' of the centre to render it comparable with the geocentric declination δ . This correction is given by

$$\begin{aligned}\sin \Delta\delta &= -\rho \sin \pi \sin(\phi' - \delta') \\ \text{or} \quad \Delta\delta &= -0.999957 \rho \pi \sin(\phi' - \delta') \\ \text{or} \quad \tan \Delta\delta &= -\frac{\rho \sin \pi \sin(\phi' - \delta)}{1 - \rho \sin \pi \cos(\phi' - \delta)}\end{aligned}$$

where

$$\begin{aligned}\pi &= \text{horizontal parallax} \\ \rho &= \text{geocentric radius} \\ \phi' &= \text{geocentric latitude}.\end{aligned}$$

The *Geocentric Semi-diameter* must be corrected for augmentation before being used to reduce an observed declination of the northern or southern limb to the declination of the centre.

$$\begin{aligned}\text{If} \quad s &= \text{geocentric semi-diameter} \\ s' &= \text{augmented semi-diameter}\end{aligned}$$

then

$$s' = \frac{s \sin(\phi' - \delta')}{\sin(\phi' - \delta)}$$

in which we may put, with sufficient accuracy,

$$\delta' = \delta - \rho \pi \sin(\phi' - \delta)$$

or, rigorously,

$$\delta' = \delta + \Delta\delta$$

$\Delta\delta$ being defined in the preceding paragraph.

The *Equatorial Horizontal Parallax* is the geocentric value (as on pages 56-71) interpolated to the time of transit at Greenwich.

At certain times when the east point of the Moon is fully illuminated the west point is nearly so, and vice versa; similarly for the north and south points. If the defect of illumination is not too great it is possible to observe two opposite limbs, the observation of one being really an observation of the terminator and not of the limb, and being corrected by the amount of the *Defective Illumination*, as given in the footnotes. It must be emphasised that the values given for defective illumination, as well as the indications for illuminated limbs, apply only to transit at Greenwich, and not to other observatories. They are derived as follows.

- Let α = R.A. of Moon's centre
 δ = geocentric declination of Moon's centre
 δ' = apparent declination of Moon's centre = $\delta - \pi \sin(\phi - \delta)$
 α_0 , δ_0 = Sun's right ascension and declination
 π = Moon's horizontal parallax
 S = sidereal time of semi-diameter passing meridian
 s = geocentric semi-diameter
 ϕ = geographical latitude

the variable quantities being interpolated to the time of transit. Then, if θ is the altitude of the Sun above the horizon for an observer at the north point of the Moon's disc,

$$\sin \theta = \sin \delta_0 \cos \delta' - \cos \delta_0 \sin \delta' \cos(\alpha - \alpha_0)$$

If θ is positive the north limb is full and the correction for defective illumination is to be applied to the south limb, and vice versa. If the time of transit is before the time of Full Moon limb I is full and the correction for defective illumination is to be applied to limb II, and vice versa.

$$\begin{aligned} \text{Defective illumination in R.A.} &= \frac{1}{2} S \sin^2(\alpha - \alpha_0) \cos^2 \delta_0 \\ \text{Defective illumination in Dec.} &= s(1 - \cos \theta) = \frac{1}{2} s \sin^2 \theta \end{aligned}$$

The defective illumination in R.A. is given only when $\alpha - \alpha_0$ at transit lies between $11^{\text{h}} 40^{\text{m}}$ and $12^{\text{h}} 20^{\text{m}}$, and the defective illumination in declination when θ is less than 3° .

Heliocentric Longitudes, Latitudes and Radii Vectores of Planets

The heliocentric places, which are referred to the mean equinox of date, are from the Tables of Newcomb and Hill in the *Astronomical Papers of the American Ephemeris and Nautical Almanac*.

The heliocentric longitude and latitude and the logarithm of the radius vector of Mercury are given each year in the *Nautical Almanac* (pages 180-183 in 1935). Before 1931 these quantities were given for Greenwich mean noon; they are now, in common with the other quantities in the *Almanac*, given for mean midnight.

The corresponding data for Venus are given for 1916-1918 in an appendix to the *Nautical Almanac* for 1915, and for 1919-1940 in an appendix to the issue

for 1916. For Mars the values for 1916-1918 are given in the appendix to the *Nautical Almanac* for 1915, and for 1919-1940 in an appendix to the issue for 1917; Ross's corrections are given in an appendix to the *Almanac* for 1920. For Jupiter, Saturn, Uranus and Neptune the values for 1916-1940 are given in the appendix to the *Nautical Almanac* for 1915.

Heliocentric places, referred to the standard equinox of 1950.0, are given in *Planetary Co-ordinates* (see page 777).

Planets at 0^h (Pages 184-239)

The *Apparent Right Ascension* and *Declination* are referred to the true equator and equinox of date, and are corrected for planetary aberration. The short-period terms of nutation are not included.

The adopted *Semi-diameters* at unit distance, and the authority for each, are

Mercury	3.34	Le Verrier
Venus	8.41	Auwers
Mars	4.68	Hartwig
Jupiter (Equatorial)	98.47	Sampson
Jupiter (Polar)	91.91	Sampson
Saturn (Equatorial)	83.33	Struve
Saturn (Polar)	74.57	Struve
Uranus	34.28	Barnard, See, Wirtz
Neptune	36.56	Barnard

The *Horizontal Parallaxes* are based on a parallax at unit distance of 8".80.

In the *Logarithm of the True Distance from the Earth* the word *true* is used to emphasise the fact that the distance given is the actual distance at 0^h, and not at the moment when the light that reaches an observer at 0^h left the planet. In the case of Mercury, the distance from the Earth (not its logarithm) is given.

The time of *Meridian Passage* at Greenwich may be interpolated to give the local mean times of passage over other meridians.

In the formation of the geocentric ephemeris from the heliocentric ephemeris, the following notation and methods are used.

λ_0 = Sun's longitude, referred to mean equinox of date, not affected by aberration, as given by Newcomb's *Tables*

λ = Sun's longitude, referred to true equinox of date = λ_0 + nutation in longitude

β = Sun's latitude referred to ecliptic of date, as given by Newcomb's *Tables*

R = radius vector of Sun

l_0 = heliocentric longitude of planet, referred to mean equinox of date, as given by the tables mentioned on page 791

l = heliocentric longitude of planet, referred to true equinox of date = l_0 + nutation in longitude

b = heliocentric latitude of planet

r = radius vector of planet

ϵ = apparent obliquity

α = geocentric right ascension of planet

δ = geocentric declination of planet

Δ = geocentric distance of planet.

The formulæ used for conversions up to and including 1940 are

$$\tan \psi = \frac{r \cos b \sin(l - \lambda)}{R + r \cos b \cos(l - \lambda)}$$

$$\text{Geocentric longitude} = \lambda + \psi$$

$$\text{Geocentric latitude} = \tan^{-1} \frac{r \sin b \sin \psi}{r \cos b \sin(l - \lambda)} + \frac{R\beta}{\Delta}$$

$$= \tan^{-1} \frac{r \sin b \cos \psi}{R + r \cos b \cos(l - \lambda)} + \frac{R\beta}{\Delta}$$

$$\begin{aligned} \text{Geocentric distance} &= \Delta = r \cos b \sin(l - \lambda) \operatorname{cosec} \psi \sec(\text{geocentric lat.}) \\ &= \{R + r \cos b \cos(l - \lambda)\} \sec \psi \sec(\text{geocentric lat.}) \end{aligned}$$

The first of the alternative formulæ for latitude and distance are used when ψ is near 90° or 270° , and the second when it is near 0° or 180° .

The planetary aberration, or correction to the planet's position to allow for its motion during the time taken by light to reach the Earth from the planet, is introduced at this stage. As in the case of the Sun (page 780) the necessary correction is $-0.0028841 \Delta \times \text{motion in } 2^d$. The motion in 2^d is obtained by subtracting the uncorrected geocentric longitude (or latitude) on the day before that for which the calculation is being made from that on the day following.

Calling L and B the corrected geocentric longitude and latitude

$$\tan \theta = \tan B \operatorname{cosec} L$$

$$\tan \alpha = \tan L \sec \theta \cos(\theta + \epsilon)$$

$$\tan \delta = \sin \alpha \tan(\theta + \epsilon)$$

The above formulæ have been used in the past with logarithmic calculations, but, in view of the present availability of calculating machines, the following simpler procedure has been adopted.

$$X = R \cos \lambda$$

$$Y = R (\sin \lambda \cos \epsilon - 19.3 \beta)$$

$$Z = R (\sin \lambda \sin \epsilon + 44.5 \beta)$$

β being in seconds of arc, and the numerical coefficients in units of the seventh decimal. These values are readily formed from quantities already found (see page 779) in the process of converting the Sun's longitude and latitude to right ascension and declination.

$$x = r \cos b \cos l$$

$$y = r \cos b (\sin l \cos \epsilon - \tan b \sin \epsilon)$$

$$z = r \cos b (\sin l \sin \epsilon + \tan b \cos \epsilon)$$

$$\Delta \cos \delta_0 \cos \alpha_0 = \xi = x + X$$

$$\Delta \cos \delta_0 \sin \alpha_0 = \eta = y + Y$$

$$\Delta \sin \delta_0 = \zeta = z + Z$$

which are solved thus:—

$$\Delta = \sqrt{\xi^2 + \eta^2 + \zeta^2}$$

$$\tan \alpha_0 = \frac{\eta}{\xi} \quad (\text{used if } \eta \text{ is less than } \xi)$$

$$\cot \alpha_0 = \frac{\xi}{\eta} \quad (\text{used if } \xi \text{ is less than } \eta)$$

$$\sin \delta_0 = \frac{\zeta}{\Delta}$$

$$\alpha = \alpha_0 - 0.0028841 \Delta \times \text{motion of } \alpha_0 \text{ in } 2^d$$

$$\delta = \delta_0 - 0.0028841 \Delta \times \text{motion of } \delta_0 \text{ in } 2^d$$

It may be remarked that, since this process is to be applied to all the planets, the quantities X , Y , Z , $\sin \epsilon$ and $\cos \epsilon$ need be computed once only. The quantities $\sin \epsilon$ and $\cos \epsilon$ are also used in the conversion of the Moon's longitude and latitude to right ascension and declination.

For Uranus and Neptune the geocentric ephemeris is computed first at intervals of four days, and then interpolated. This is the maximum possible interval, as the Earth does not move in a purely elliptical orbit round the Sun, having in addition a motion in an orbit round the centre of gravity of the Earth and Moon, the point that moves round the Sun in accordance with Kepler's laws. The period of this subsidiary motion is the lunar tropical month of $27^d.322$, so that the motion in four days is 53° . Harmonic terms that move through more than one radian ($57^\circ.3$) in the interval between successive calculations would, if included, result in the failure of the quantities in which they are included to difference properly.

Planets at Transit at Greenwich (Pages 240-261)

These ephemerides facilitate the reduction of meridian observations of the planets. They may be reduced to any other longitude by interpolation. The right ascensions and declinations are geocentric, are referred to the true equator and equinox of date, are corrected for aberration but not for the short-period terms of nutation, and are for the centre of the planet. For the outer planets the ephemeris is given only when the transit is later than 16^h G.M.T. (or some later limit depending on the time of sunset) or earlier than 2^h G.M.T.

The semi-diameter in arc is computed by interpolation of the values at 0^h . The sidereal time of semi-diameter passing meridian, or the correction required to reduce an observation of a fully-illuminated limb to the centre, is taken as

$$\frac{1}{15} \sec \delta \times \text{semi-diameter in arc}$$

in which a small term depending on the planet's motion in right ascension is regarded as negligible. In the case of Jupiter and Saturn the sidereal times of the equatorial semi-diameter passing the meridian, and the polar semi-diameters, have been calculated on the assumption, only approximately true, that the extremities of the axes of rotation are the north and south points of the discs.

Besselian and Independent Day Numbers (Pages 262-289)

The formulæ from which these quantities are computed are given below. The constants of precession, nutation and aberration involved are those adopted by the *Conférence Internationale des Etoiles Fondamentales* which met in Paris in 1896.

L = Sun's mean longitude

λ = Sun's true longitude, affected by nutation, but not by aberration

Γ = mean longitude of the Sun's perigee

ζ = Moon's mean longitude

Ω = mean longitude of the Moon's ascending node

Γ' = mean longitude of the Moon's perigee

ϵ = true obliquity

τ = fraction of the tropical year

T = time from 1900.0, measured in tropical centuries.

Long-period terms

$$\begin{aligned}
 A = & \tau - 0.34215 \sin \Omega \\
 & - 0.00031 T \sin \Omega \\
 & + 0.00415 \sin 2\Omega \\
 & - 0.02526 \sin 2L \\
 & + 0.00251 \sin(L - \Gamma) \\
 & - 0.00099 \sin(3L - \Gamma) \\
 & + 0.00042 \sin(L + \Gamma) \\
 & + 0.00025 \sin(2L - \Omega)
 \end{aligned}$$

Short-period terms

$$\begin{aligned}
 A' = & -0.00405 \sin 2\ell \\
 & + 0.00134 \sin(\ell - \Gamma') \\
 & - 0.00068 \sin(2\ell - \Omega) \\
 & - 0.00052 \sin(3\ell - \Gamma') \\
 & + 0.00030 \sin(\ell - 2L + \Gamma') \\
 & + 0.00023 \sin(\ell + \Gamma') \\
 & + 0.00012 \sin 2(\ell - L)
 \end{aligned}$$

$$\begin{aligned}
 B = & -9.210 \cos \Omega \\
 & + 0.090 \cos 2\Omega \\
 & - 0.551 \cos 2L \\
 & - 0.022 \cos(3L - \Gamma) \\
 & + 0.009 \cos(L + \Gamma) \\
 & + 0.007 \cos(2L - \Omega)
 \end{aligned}$$

$$\begin{aligned}
 B' = & -0.088 \cos 2\ell \\
 & - 0.018 \cos(2\ell - \Omega) \\
 & - 0.011 \cos(3\ell - \Gamma') \\
 & + 0.005 \cos(\ell + \Gamma')
 \end{aligned}$$

$$C = -20''.47 \cos \epsilon \cos \lambda = -18''.780 \cos \lambda$$

$$D = -20''.47 \sin \lambda$$

$$\begin{aligned}
 E = & \frac{\text{planetary precession}}{\text{luni-solar precession}} \times \text{nutations in longitude} \\
 = & (0.000165 - 0.000025 T) \times \text{nutations in longitude}
 \end{aligned}$$

If

$$\psi = \text{annual luni-solar precession} = 50''.3708 + 0''.0050 T$$

$$\Delta\psi = \text{long-period terms of nutations in longitude}$$

$$d\psi = \text{short-period terms of nutations in longitude}$$

$$\Delta\epsilon = \text{long-period terms of nutations in obliquity}$$

$$d\epsilon = \text{short-period terms of nutations in obliquity}$$

then

$$A = \tau + \frac{\Delta\psi}{\psi} = \tau + \Delta\psi (0.0198528 - 0.0000020 T)$$

$$B = -\Delta\epsilon \quad A' = \frac{d\psi}{\psi} \quad B' = -d\epsilon$$

The independent day numbers are derived from the Besselian day numbers by the following relations:—

$$f = mA + E$$

$$= m\tau + \frac{1}{18} \Delta\psi \cos \epsilon$$

$$g \sin G = B$$

$$g \cos G = nA$$

$$h \sin H = C$$

$$h \cos H = D$$

$$i = C \tan \epsilon$$

$$= -8''.145 \cos \lambda$$

$$f' = \frac{1}{18} d\psi \cos \epsilon$$

$$= mA' \text{ approximately}$$

$$g' \sin G' = B'$$

$$g' \cos G' = nA'$$

where m and n are given on page 54.

The quantities $1 + x$, $1 + y$ and $\frac{g'}{g_0}$, which may be termed Cape independent day numbers, are defined by

$$1 + x = \frac{g}{20.0521} = 0.049870 g$$

$$1 + y = \frac{h}{18.50} = 0.054054 h$$

$$\frac{g'}{g_0} = \frac{g'}{20.0521} = 0.0499 g'$$

The Besselian and independent day numbers are used to reduce the right ascension α_0 and declination δ_0 of a star from the mean equinox of the beginning of the year to the apparent equinox of date. The Besselian day numbers A , B and E or the independent day numbers f , g and G yield the reduction for precession and the long-period terms of nutation, while C and D or h , H and i yield the reduction for aberration. The effect of the short-period terms of nutation is given by A' and B' , or by f' , g' and G' .

In addition to the above corrections the mean position of a star must be corrected for proper motion and for parallax (if known and if sensible) in order to obtain the apparent position. In the case of double stars a correction for orbital motion may also be necessary.

The Besselian day numbers are used with Besselian star constants, defined as follows:—

$$\begin{aligned} a &= m^s + n^s \sin \alpha_0 \tan \delta_0 & a' &= n'' \cos \alpha_0 \\ b &= \frac{1}{15} \cos \alpha_0 \tan \delta_0 & b' &= -\sin \alpha_0 \\ c &= \frac{1}{15} \cos \alpha_0 \sec \delta_0 & c' &= \tan \epsilon \cos \delta_0 - \sin \alpha_0 \sin \delta_0 \\ d &= \frac{1}{15} \sin \alpha_0 \sec \delta_0 & d' &= \cos \alpha_0 \sin \delta_0 \end{aligned}$$

Denoting the proper motion by μ and supposing the parallax to be negligible, the apparent right ascension α and declination δ are found from

$$\begin{aligned} \alpha &= \alpha_0 + Aa + Bb + Cc + Dd + E + \tau\mu\alpha \\ \delta &= \delta_0 + Aa' + Bb' + Cc' + Dd' + \tau\mu\delta \end{aligned}$$

or

$$\begin{aligned} \alpha &= \alpha_0 + f + \frac{1}{15} g \sin(G + \alpha_0) \tan \delta_0 + \frac{1}{15} h \sin(H + \alpha_0) \sec \delta_0 + \tau\mu\alpha \\ \delta &= \delta_0 + g \cos(G + \alpha_0) + h \cos(H + \alpha_0) \sin \delta_0 + i \cos \delta_0 + \tau\mu\delta \end{aligned}$$

which do not include the effect of short-period terms. Their effect is

$$\begin{aligned} \Delta\alpha &= A'a + B'b = f' + \frac{1}{15} g' \sin(G' + \alpha_0) \tan \delta_0 \\ \Delta\delta &= A'a' + B'b' = g' \cos(G' + \alpha_0) \end{aligned}$$

The short-period terms attain two maxima and two minima during the lunar tropical month. They may amount to $\pm 0^s.020 \pm 0^s.008 \tan \delta$ in right ascension or $\pm 0''.13$ in declination.

The formulæ for the use of the Cape independent day numbers are given in Finlay's *Star-Correction Tables*, published as an appendix to *Cape Meridian Observations*, 1890-91. They are not quoted here, as they cannot be used without Finlay's *Tables*.

If several apparent positions of one star are required, or if the Besselian star constants are known with sufficient accuracy, the use of the Besselian day numbers is to be preferred; in other cases the independent day numbers will be found more convenient.

In the case of stars near the poles, if strict accuracy be required, higher order terms must also be included.

The correction for parallax may be written

$$\begin{aligned} \Delta\alpha &= -\frac{1}{15} \pi \sin \alpha \sec \delta X + \frac{1}{15} \pi \cos \alpha \sec \delta Y \\ \Delta\delta &= -\pi \cos \alpha \sin \delta X - \pi \sin \alpha \sin \delta Y + \pi \cos \delta Z \end{aligned}$$

where X , Y and Z are the Sun's co-ordinates given on pages 30-37.

As an illustration of the application of the above formulæ the apparent position of α Aquilæ (*Altair*) at upper transit at Greenwich on February 20 will be computed, omitting the short-period terms of nutation, the parallax being $0''.20$.

From page 305

α_0	^h 19 ^m 47 ^s 36.680	δ_0	+8° 41' 43.74"
Annual var.	+2.9263	Annual var.	+9.462
μ_α	+0.0356	μ_δ	+0.393

The Besselian star constants a and a' are the annual precessions in right ascension and declination respectively, i.e.

$$a = \text{annual variation in R.A.} - \mu_\alpha = +2^s.8907$$

$$a' = \text{annual variation in Dec.} - \mu_\delta = +9''.069$$

The remaining Besselian star constants are

$$b = +0.0046 \quad b' = +0.892$$

$$c = +0.0305 \quad c' = +0.564$$

$$d = -0.0601 \quad d' = +0.068$$

α_0	^h 19 ^m 47 ^s 36.680	^h 19 ^m 47 ^s 36.680
Sidereal time at 0 ^h (page 277)		9 ^h .9
Difference = approximate mean time of transit		= 9 ^h .9 = 0 ^d .41

Hence all the variable quantities will be interpolated to February 20.41.

From the formula given above for the correction for parallax, since $\pi = 0''.20$

$$\Delta\alpha = +0^s.012 X + 0^s.006 Y$$

$$\Delta\delta = -0''.01 X + 0''.03 Y + 0''.20 Z$$

from which, since $X = +0.86$, $Y = -0.44$, $Z = -0.19$

$$\Delta\alpha = +0^s.010 - 0^s.003 = +0^s.007$$

$$\Delta\delta = -0''.01 - 0''.01 - 0''.04 = -0''.06$$

Using the Besselian day numbers (page 267), and taking τ as 0.137 (page 277)

A	+0.4551	B	-4.87
C	-16.40	D	+9.97
α_0	^h 19 ^m 47 ^s 36.680	δ_0	+8° 41' 43.74"
Aa	+1.316	Aa'	+4.13
Bb	-0.022	Bb'	-4.34
Cc	-0.500	Cc'	-9.25
Dd	-0.599	Dd'	+0.68
E	+0.002		
$\tau\mu_\alpha$	+0.005	$\tau\mu_\delta$	+0.05
Parallax	+0.007	Parallax	-0.06
Sum = α	19 47 36.889	Sum = δ	+8 41 34.95

Using the independent day numbers (page 276) and working by logarithms

α_0	^h 19 ^m 47 ^s 36.680	δ_0	+8° 41' 43.74"
G	22 07.5		
H	20 05.2	$\log g$	1.015
$G + \alpha_0$	17 55.1	$\log \cos(G + \alpha_0)$	8.330 ⁿ
$H + \alpha_0$	15 52.8	Sum (3)	9.345 ⁿ

$\log \frac{1}{h}$	8.8239	$\log h$	1.2832
$\log g$	1.0147	$\log \cos(H + \alpha_0)$	9.7218 n
$\log \sin(G + \alpha_0)$	9.9999 n	$\log \sin \delta_0$	9.1795
$\log \tan \delta_0$	9.1845	Sum (4)	0.1845 n
Sum (1)	9.0230 n		
$\log \frac{1}{h}$	8.8239	$\log i$	0.8520 n
$\log h$	1.2832	$\log \cos \delta_0$	9.9950
$\log \sin(H + \alpha_0)$	9.9294 n	Sum (5)	0.8470 n
$\log \sec \delta_0$	0.0050		
Sum (2)	0.0415 n		
α_0	$\begin{smallmatrix} h & m \\ 19 & 47 \end{smallmatrix} 36.680$	δ_0	$\begin{smallmatrix} ^\circ & ' & '' \\ +8 & 41 & 43.74 \end{smallmatrix}$
f	+1.400	Nat. no. (3)	-0.22
Nat. no. (1)	-0.105	Nat. no. (4)	-1.53
Nat. no. (2)	-1.100	Nat. no. (5)	-7.03
$\tau \mu \alpha$	+0.005	$\tau \mu \delta$	+0.05
Parallax	+0.007	Parallax	-0.06
Sum = a	$\begin{smallmatrix} h & m \\ 19 & 47 \end{smallmatrix} 36.887$	Sum = δ	$\begin{smallmatrix} ^\circ & ' & '' \\ +8 & 41 & 34.95 \end{smallmatrix}$

These results may be compared with those on page 494. It must be remembered, however, that values computed by different processes may differ by one or two units of the last decimal. The working units 0^s.001 and 0^s.01 are so much smaller than the probable error of a single observation that such small discrepancies are unimportant, provided they are not systematic.

The natural values of the independent day numbers, tabulated on the same pages as the logarithmic values, may also be used with a slide rule, a calculating machine or Crelle's Tables.

When g or i is very small it will be found difficult, and in some cases impossible, to interpolate their logarithms. This difficulty may be overcome by interpolating the natural numbers, and, if necessary, taking the logarithm of the interpolated numbers. It will be noted that, when i is less than about 4'', $\log i$ is given to three decimals only.

The *Sidereal Time* at 0^h, to the nearest tenth of an hour, is used in determining the interpolating factor for the Besselian or independent day numbers for the time of transit of a star. This factor is

$$\frac{\alpha + \lambda - \text{Greenwich sidereal time at } 0^h}{24}$$

λ being here the longitude of the observer.

τ is the fraction of the tropical year, reckoned from the commencement of the Besselian fictitious year, or 1935.0.

The quantities j and J are explained in the following paragraph.

Differential Precession, Nutation and Aberration (Pages 275-295)

These quantities are intended to facilitate the reduction of observations in which the differences $\Delta \alpha$ and $\Delta \delta$ of right ascension and declination of a fixed star and of a moving object are determined. If the position of the star be reduced to the equinox of the beginning of the year (or to that of 1950.0), the right ascension of the moving object, referred to the same equinox, is R.A. of star + $\Delta \alpha$ + differential aberration + differential precession and nutation, and similarly for the declination.

The differential aberration is independent of the year, or of the equinox to which the observation is being reduced, so that the table given is permanent. A small term $-0.00004 \cos \lambda \sin \delta \Delta \delta$ has been omitted in the differential aberration in declination. In the case of the differential precession and nutation the values of j and J on pages 275-289 are to be used for reductions to the equinox of the beginning of the year, and those on page 294 for reductions to 1950.0.

The quantities tabulated are defined thus:—

$$F(a) = (C \sin a - D \cos a) \sin 1^m$$

For reduction to 1935.0

$$j = g \sin 1^m = 0.00436 g$$

$$J = G - 6^h$$

For reduction to 1950.0

$$j \sin J_0 = 20.044 (1950 - 1935 - A) \sin 1^m$$

$$j \cos J_0 = B \sin 1^m = 0.00436 B$$

$$J = J_0 - 1^s.5 (1950 - 1935)$$

Since $j \cos J_0$ is very small in comparison with $j \sin J_0$

$$j = j \sin J_0 + \frac{(j \cos J_0)^2}{2j \sin J_0}$$

The small correction to J_0 arises from the fact that the right ascension actually used is that for 1950.0, whereas it is theoretically more accurate to use the value for the epoch mid-way between the time of observation and 1950.0. Assuming an annual precession of $+3^s.0$, the small correction above enables the star's right ascension for 1950.0 to be used without sensible error. If $\Delta \alpha$ or $\Delta \delta$ is large, α and δ should be replaced by $\alpha + \frac{1}{2} \Delta \alpha$ and $\delta + \frac{1}{2} \Delta \delta$.

The formulæ of application are given on pages 290, 292 and 294, and all the necessary trigonometrical functions on pages 294 and 295.

Mean Places of Stars (Pages 296-307)

The *Mean Places of Stars* and other data given on these pages are taken from *Positions and Proper Motions of 1504 Standard Stars for the Equinox 1925.0*, by W. S. Eichelberger, in the *Astronomical Papers of the American Ephemeris and Nautical Almanac*, Vol. X, Part I.

The *Magnitudes* have been taken from *Harvard Annals* 50, and are, therefore, the same as those given in the Henry Draper catalogue. In accordance with *Harvard Bulletin* No. 822 the magnitude of γ Argus has been corrected to 1.92.

The *Annual Variations* are the sums of the annual precessions and the annual proper motions.

Stars that lie within 10° of either pole are designated *Circumpolar Stars*, and their mean places are given separately on page 307.

The footnotes give proper names, the range of magnitude of variable stars, and, in the case of double stars, where necessary to guard against mis-identification, the approximate magnitude, distance and position angle of the companion.

Apparent Places of Stars (Pages 308-520)

The apparent places of 25 circumpolar stars (pages 308-357) are given for every day, and include the effect of short-period terms of nutation. The northern stars are given first, followed by the southern stars. When a star passes the meridian twice in any one mean solar day (as happens once each year) the apparent places

are given for both transits. The values of $\sec \delta$ and $\tan \delta$ correspond to the mean place.

The apparent places of stars lying between the limits $\pm 80^\circ$ of declination (pages 358–520) are given for every tenth transit at Greenwich, and do not include the effect of short-period terms of nutation. For stars whose declination exceeds $\pm 60^\circ$ only two decimals are given in the right ascension. The mean solar date on which two transits occur is given to the left of the column R.A. The date in the column *Mean Solar Date* is strictly applicable to the middle star on that page, and is rounded to the nearest tenth of a day, except when the fraction lies between .95 and 1.00, when it is rounded to .9, in order to avoid confusion of date. A system of footnotes removes any possibility of ambiguity as to the transit to which the given figures relate. The first differences of each co-ordinate are given, but without signs, the dashes denoting a change of sign.

The six following stars have been corrected for annual parallax.

ϵ Eridani	0.30	α Centauri	0.76
α Canis Majoris (<i>Sirius</i>)	0.37	α Aquilæ (<i>Altair</i>)	0.20
α Canis Minoris (<i>Procyon</i>)	0.31	δ Cygni	0.30

The seven following stars have been corrected for the effect of orbital motion, the corrections and the orbits on which they are based being given in Appendix II to Eichelberger's catalogue.

α Canis Majoris (<i>Sirius</i>)	α Centauri
α Geminorum (<i>Castor</i>)	ζ Herculis
α Canis Minoris (<i>Procyon</i>)	δ Cygni
γ Virginis	

The further corrections required for the effect of short-period terms of nutation are

$$\Delta a = A'a + B'b$$

$$\Delta \delta = A'a' + B'b'$$

for which the Besselian star constants a , b , a' , b' are given to the degree of accuracy necessary.

The *Authority* is the office in which the calculation of the apparent place has been made. The *Catalogue Number* is the number in Eichelberger's catalogue.

Eclipses (Pages 521–535)

In computing the eclipses the following corrections have been applied to the tabular positions of the Sun and Moon as given in the *Nautical Almanac*. They correspond to corrections of $+1''.5$ to the mean longitude as found from Newcomb's *Tables of the Sun*, and of $+5''.0$ to the mean longitude and $-0''.5$ to the latitude as found from Brown's *Tables of the Moon*. They are assumed to be constant during the eclipse.

G.M.T.	$\Delta \lambda_\odot$	$\Delta \beta_\odot$	$\Delta \alpha_\odot$	$\Delta \delta_\odot$	$\Delta \lambda_\zeta$	$\Delta \beta_\zeta$	$\Delta \alpha_\zeta$	$\Delta \delta_\zeta$
Jan. 5 05	+1.5	0.0	+0.11	+0.2	+5.7	0.0	+0.41	+0.6
Jan. 19 16	+1.5	0.0	+0.11	+0.3	+4.5	-0.9	+0.30	-1.8
Feb. 3 16	+1.5	0.0	+0.10	+0.4	+5.8	0.0	+0.38	+1.7
June 30 20	+1.5	0.0	+0.11	-0.1	+4.8	-0.9	+0.35	-1.2
July 16 05	+1.5	0.0	+0.11	-0.2	+5.5	0.0	+0.39	+0.9
July 30 09	+1.5	0.0	+0.10	-0.4	+4.6	-0.9	+0.29	-2.0
Dec. 25 18	+1.5	0.0	+0.11	0.0	+5.2	0.0	+0.37	+0.1

Eclipses of the Sun. The particulars given under *Elements of the Eclipse* are for the moment of conjunction of the Sun and Moon in right ascension, and not for the time of New Moon, which is the moment of conjunction of the Sun and Moon in longitude.

The Sun's true semi-diameter is based on a value at unit distance of $959''.63$ as given by Auwers in *Astronomische Nachrichten*, 3046, 367. The semi-diameter used for the Sun's ephemeris elsewhere in the *Nautical Almanac* is based on a value of $961''.18$ at unit distance; the difference represents the allowance for irradiation, the effects of which must be removed for eclipse purposes.

The Moon's true semi-diameter is based on a value 0.272274 of k , the ratio of the Moon's equatorial radius to that of the Earth; the value used for the semi-diameter in the Moon's ephemeris is 0.272481 .

The *Besselian Elements of the Eclipse* are given to facilitate the accurate computation of the circumstances of the eclipse for any place on the Earth's surface. Their geometrical significance is as follows.

The fundamental plane passes through the centre of the Earth and is at right angles to the axis of the Moon's shadow, i.e. to the line joining the centres of the Sun and Moon. The position of a point may be defined by a system of rectangular axes with origin at the centre of the Earth. The x axis is the intersection of the equator and the fundamental plane and is directed positively towards the east as seen from the Moon; the y axis is perpendicular to that of x and is directed positively towards the north; the z axis is parallel to the axis of the shadow and is positive towards the Moon. The unit of measurement adopted for these co-ordinates is the Earth's equatorial radius.

The radius of the shadow cone on the fundamental plane is denoted by l , and x and y are the co-ordinates of the centre of the shadow, α , δ and α being the co-ordinates of the centre of the Moon. The direction of the shadow is defined by μ and d , which are the Greenwich hour angle and the declination of the point Z on the celestial sphere towards which the axis of the shadow is directed. The values of x , y , l , $\sin d$, $\cos d$ and μ are tabulated for every 10 minutes during the eclipse. $\tan f$, where f is the angle that the boundary of the shadow cone makes with the axis of the shadow, is constant throughout the eclipse.

The formulæ for determining these quantities are as follows. Let α_ϵ , δ_ϵ , r and α_0 , δ_0 , R be the right ascension, declination and distance from the centre of the Earth of the centres of the Moon and Sun respectively, and let $b = \frac{\sin \pi_0}{\sin \pi_\epsilon}$ where π_0 and π_ϵ are the Sun's and Moon's equatorial horizontal parallaxes. Then a and d , the right ascension and declination of the point Z , are given by

$$a = \alpha_0 - \frac{b}{1-b} \cos \delta_\epsilon \sec \delta_0 (\alpha_\epsilon - \alpha_0)$$

$$d = \delta_0 - \frac{b}{1-b} (\delta_\epsilon - \delta_0)$$

Whence

$$\mu = \text{Greenwich sidereal time} - a$$

$$x = r \cos \delta_\epsilon \sin (\alpha_\epsilon - a)$$

$$y = r [\sin \delta_\epsilon \cos d - \cos \delta_\epsilon \sin d \cos (\alpha_\epsilon - a)]$$

$$z = r [\sin \delta_\epsilon \sin d + \cos \delta_\epsilon \cos d \cos (\alpha_\epsilon - a)]$$

$$\text{where } r = \frac{1}{\sin \pi_\epsilon}$$

For the penumbral cone

$$\tan f_1 = \frac{0.00466407}{R(1-b)} \quad l_1 = z \tan f_1 + 0.272277$$

and for the umbral cone

$$\tan f_2 = \frac{0.00464083}{R(1-b)} \quad l_2 = z \tan f_2 - 0.272277$$

The *Circumstances of the Eclipse* are, in the case of partial eclipses, the times, for the Earth generally, of beginning, greatest phase and end, together with the latitudes and longitudes of the places on the Earth at which these phases occur. In the case of total and annular eclipses, the same data are given for the beginning and end of central eclipse; also the time and place at which central eclipse occurs at local apparent noon, or, when the eclipse occurs on the side of the elevated pole remote from the Sun, the time and place at which central eclipse occurs at local apparent midnight.

The eclipse maps show the localities where the eclipses are visible and enable the times of beginning and end for any place to be approximately obtained.

Local Predictions. The times of beginning and end of the eclipse for a given observer are determined by the fact that at these moments the distance of the observer from the axis of the penumbra will be equal to the radius of the shadow cone on a plane through the point of observation and parallel to the fundamental plane. The procedure adopted is to compute the co-ordinates ξ , η and ζ of the observer, together with their variations, for some assumed moment near the time of the phase required. The co-ordinates x and y of the centre of the shadow, and their variations, are determined from the values tabulated. From these two sets of co-ordinates the distance and direction of the observer from the centre of the shadow are obtained, together with their variations. The radius of the penumbra at the distance ζ above the fundamental plane is also calculated, and by the use of the computed values of the several variations the correction to the assumed time to give the true time of the phase concerned is obtained.

The formulæ are as follows:—

$$\begin{aligned} \xi &= \rho \cos \phi' \sin(\mu - \lambda) \\ \eta &= \rho \sin \phi' \cos d - \rho \cos \phi' \sin d \cos(\mu - \lambda) \\ \zeta &= \rho \sin \phi' \sin d + \rho \cos \phi' \cos d \cos(\mu - \lambda) \end{aligned}$$

where $\rho \sin \phi'$ and $\rho \cos \phi'$ are the geocentric co-ordinates of the place of observation (see pages 726–727) and λ is its longitude.

The variations per minute are

$$\begin{aligned} \xi' &= \{0.0043635 + 0.0000012(10 - \Delta\alpha_0)\} \rho \cos \phi' \cos(\mu - \lambda) \\ \eta' &= \{0.0043635 + 0.0000012(10 - \Delta\alpha_0)\} \xi \sin d \end{aligned}$$

where $\Delta\alpha_0$ is the Sun's hourly motion, in seconds of time, as given in the elements of the eclipse. Since $\Delta\alpha_0$ and $\sin d$ may here be regarded as constant throughout the eclipse, the numerical values of the coefficients in ξ' and η' are given at the foot of the Besselian elements. The variations per minute of x and y , denoted by x' and y' , are obtained by dividing the differences between successive tabular values of x and y by 10.

The distance m and position angle M of the axis of the shadow relative to the observer may be determined from

$$\begin{aligned} m \sin M &= x - \xi \\ m \cos M &= y - \eta \end{aligned}$$

The magnitude n and direction N of the motion of the centre of the shadow relative to the observer are found from

$$\begin{aligned}n \sin N &= x' - \xi' \\n \cos N &= y' - \eta'\end{aligned}$$

The radius L at a distance ζ above the fundamental plane is

$$L = l - \zeta \tan f$$

When the eclipse is beginning or ending $m = L_1$, and when the annular or the total phase is beginning or ending $m = L_2$.

The correction τ to the assumed time may be computed from

$$\tau = - \frac{m \cos(M - N)}{n} + \frac{L \cos \psi}{n}$$

where
$$\sin \psi = \frac{m \sin(M - N)}{L}$$

The value of ψ for which $\cos \psi$ is negative should be taken for the beginning of the eclipse, for the beginning of the annular phase or the end of the total phase, and the value for which $\cos \psi$ is positive for the end of the eclipse, for the end of the annular phase or the beginning of the total phase. If the correction τ exceeds two or three minutes, and great accuracy is desired, a repetition of the computation should be made, using the adjusted times in place of those originally assumed.

The time of greatest eclipse or the middle of the eclipse is the moment when the value of m is a minimum, and is not necessarily the time midway between the beginning and the end. If a time is assumed for this phase the correction is given by

$$\tau = - \frac{m \cos(M - N)}{n}$$

The magnitude of greatest eclipse is the fraction of the Sun's diameter that is obscured by the Moon at mid-eclipse, measured along the line joining the centres of the two discs, and is given by

$$\frac{L_1 - \Delta}{2L_1 - 0.5459}$$

where $\Delta = m \sin(M - N)$ and is always to be taken positively.

The position angle of the point of contact, measured from the north point of the Sun's limb in the direction N.E.S.W., may be obtained from

$$P = N + \psi$$

or, if reckoned from the vertex, from

$$V = P - C$$

where C , the parallactic angle, is given by $\tan C = \frac{\xi}{\eta}$.

An alternative method of computing the time of beginning or end of an eclipse consists in finding values of m at convenient intervals—10^m or 1^m—near the time of the phase required, from

$$m^2 = (x - \xi)^2 + (y - \eta)^2$$

and then determining when $L - m = 0$. The position angle of the point of contact is found by interpolating $x - \xi$ and $y - \eta$ to the time of contact, and finding M , since at this moment $M = P$.

The middle of an eclipse may be determined by finding $x_1 - \xi_1$ and $y_1 - \eta_1$ for a time before the middle, and $x_2 - \xi_2$ and $y_2 - \eta_2$ for a time after the middle. The middle is then at the vanishing point of

$$(x - \xi)\{(x_2 - \xi_2) - (x_1 - \xi_1)\} + (y - \eta)\{(y_2 - \eta_2) - (y_1 - \eta_1)\}$$

which is computed for the two times, and which is negative before the middle and positive afterwards. To determine the magnitude of greatest eclipse, L_1 , $x - \xi$ and $y - \eta$ are interpolated to the time of the middle, and m is found. The magnitude is then

$$\frac{L_1 - m}{2L_1 - 0.5459}$$

If great accuracy is required, the two chosen times should not be more than one minute apart.

The angle M is, at all times, the position angle of the centre of the Moon referred to the centre of the Sun, or the direction of greatest obscuration, the direction of greatest illumination being $M \pm 180^\circ$. The apparent semi-diameter of the Sun, as adopted for eclipse purposes, is

$$\text{Sun's semi-diameter} = \frac{959''.63}{R}$$

The apparent semi-diameter of the Moon, including the effect of augmentation, is

$$\frac{L_1 - L_2}{L_1 + L_2} \times \text{Sun's semi-diameter}$$

The apparent distance of the Moon's centre from that of the Sun is

$$\frac{2m}{L_1 + L_2} \times \text{Sun's semi-diameter}$$

The maximum angular breadth of the obscured portion of the Sun is

$$\frac{2(L_1 - m)}{L_1 + L_2} \times \text{Sun's semi-diameter}$$

The maximum angular breadth of the illuminated portion is

$$\frac{2(L_2 + m)}{L_1 + L_2} \times \text{Sun's semi-diameter}$$

The position angles of the cusps, reckoned from the north point of the Sun through the east in the usual way, are $M \pm A$, where

$$\tan^2 \frac{A}{2} = \frac{(L_1 - m)(m - L_2)}{(L_1 + m)(m + L_2)}$$

The position angles of the cusps, reckoned from the north point of the Moon, are $M \pm 180^\circ \pm B$, where

$$\tan^2 \frac{B}{2} = \frac{(L_1 - m)(m + L_2)}{(L_1 + m)(m - L_2)}$$

Note that

$$\frac{\sin A}{\sin B} = \frac{L_1 - L_2}{L_1 + L_2} = \frac{\text{Moon's semi-diameter}}{\text{Sun's semi-diameter}}$$

The "overhang" of the Moon, measured along the Sun's radius, at a point r° distant from the cusp, as measured along the Moon's limb, is

$$\frac{2m \sin r^\circ \sin A}{L_1 + L_2} \times \text{Sun's semi-diameter}$$

$$= \frac{2m \sin r^\circ \sin B}{L_1 + L_2} \times \text{Moon's semi-diameter}$$

The angular distance, measured in degrees along the Moon's limb, from either cusp to the point where the Moon forms an imaginary cusp with a stratum of the Sun's atmosphere S seconds of arc above the adopted semi-diameter, is

$$\frac{S (L_1 + L_2)}{2 \sin r^\circ m \sin A \times \text{Sun's S.D.}} = \frac{0.02985 RS (L_1 + L_2)}{m \sin A}$$

This formula, which is a differential one, must not be used if the resulting angular distance is more than 3° or 4° .

In the preparation of diagrams illustrating the appearance of the illuminated portion of the Sun at any moment, the Sun's semi-diameter may be regarded as unity in the above formulæ. Also it will suffice to put $L_2 = L_1 - 0.5459$.

The altitude of the Sun and the parallactic angle C may be computed from

$$\sin \text{altitude} = \sin \phi \sin d + \cos \phi \cos d \cos(\mu - \lambda)$$

$$\sin C = \cos \phi \sin(\mu - \lambda) \sec \text{altitude}$$

in which $\cos C$ has the same sign as η . In cases where a possible error of 0.2 in these quantities would be considered negligible, it suffices to use

$$\sin \text{altitude} = \zeta \qquad \tan C = \frac{\xi}{\eta}$$

The rigorous determination of the shape and position of the Moon's shadow on the Earth at any given moment must be made by text-book methods. A good approximation is obtained by regarding the outline of the shadow as an ellipse, centred at that point on the central line at which mid-eclipse occurs at the given moment, having its major axis directed towards the Sun, and having semi-major and semi-minor axes, in miles, of $3963 L_2 \operatorname{cosec}(\text{Sun's altitude})$ and $3963 L_2$ respectively.

Example of Local Prediction. The circumstances of the partial eclipse of February 3 will be computed for Montreal, for which we find, from pages 690-691, $\lambda = +73^\circ 34' 7''$, $\rho \sin \phi' + 0.70974$, $\rho \cos \phi' = +0.70205$. If approximate times and angles only are required, it suffices to use a simple 3-figure calculation as follows, in which $\sin d$ and $\cos d$ have the fixed values -0.287 and $+0.958$.

G.M.T.	15 ^h	16 ^h	17 ^h	18 ^h
μ	41 31	56 31	71 31	86 31
λ	+73 35	+73 35	+73 35	+73 35
$\mu - \lambda = h$	-32 04	-17 04	-2 04	+12 56
$\sin h$	-0.531	-0.293	-0.036	+0.224
$\cos h$	+0.847	+0.956	+0.999	+0.975
x	-1.115	-0.576	-0.037	+0.502
ξ	-0.373	-0.206	-0.025	+0.157
$x - \xi$	-0.742	-0.370	-0.012	+0.345
y	+0.780	+1.000	+1.221	+1.441
η	+0.850	+0.872	+0.881	+0.876
$y - \eta$	-0.070	+0.128	+0.340	+0.565

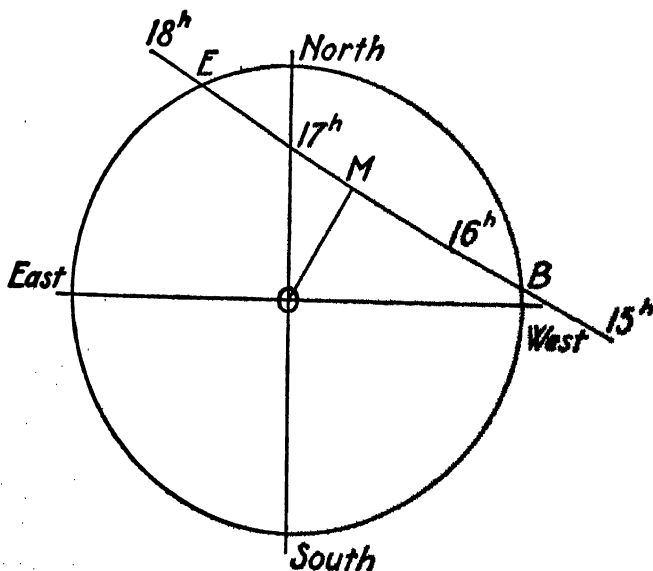
EXPLANATION, 1935

These values of $x - \xi$ and $y - \eta$ are now plotted on any convenient scale, e.g. 1 unit = 10 inches, or 5 inches, or 10 centimetres, remembering that the positive direction of $x - \xi$ is to the east, and of $y - \eta$ to the north. The value of L_1 may be assumed to be $L_1 = 0.003$, the latter term being the average value of $\xi \tan f$; the maximum value is 0.005. A circle of radius L_1 is drawn with centre at the origin. The plotted points are joined by straight lines, cutting the circle at B and E. OM is drawn perpendicular to the plotted line. The times corresponding to B, M and E represent the beginning, middle and end of the eclipse, while the position angles of the points of first and last contact are the angles NOB and NOE, measured through the east in the usual way. The distance $OM = \Delta$. Measurement of the accompanying diagram gives

	G.M.T.	P
Beginning	15 33	274
Middle	16 36	329
End	17 39	24

Magnitude 0.45

The angle shown under P for the middle of the eclipse is the direction OM, i.e. the direction of the Moon, or of greatest obscuration.



More accurate results can be obtained by a 4-figure calculation, as shown. The times chosen for this calculation, which are at intervals of 10^m (to avoid interpolation of x , y and μ) may be found from the map on page 525, or from the previous calculation.

	BEGINNING		MIDDLE		END	
G.M.T.	15 ^h 30 ^m	15 ^h 40 ^m	16 ^h 30 ^m	16 ^h 40 ^m	17 ^h 30 ^m	17 ^h 40 ^m
μ	49 01.3	51 31.3	64 01.3	66 31.3	79 01.4	81 31.4
λ	+73 34.7	+73 34.7	+73 34.7	+73 34.7	+73 34.7	+73 34.7
$\mu - \lambda = h$	-24 33.4	-22 03.4	-9 33.4	-7 03.4	+5 26.7	+7 56.7
$\sin h$	-0.4156	-0.3755	-0.1660	-0.1229	+0.0949	+0.1382
$\cos h$	+0.9096	+0.9268	+0.9861	+0.9924	+0.9955	+0.9904
$\sin d$	-0.2868		-0.2866		-0.2864	
$\cos d$	+0.9580		+0.9581		+0.9581	
π	-0.8454	-0.7556	-0.3064	-0.2166	+0.2326	+0.3224
ξ	-0.2918	-0.2636	-0.1165	-0.0863	+0.0666	+0.0970
$\pi - \xi$	-0.5536	-0.4920	-0.1899	-0.1303	+0.1660	+0.2254
Diff.	+616		+596		+594	
γ	+0.8899	+0.9266	+1.1104	+1.1472	+1.3311	+1.3679
η	+0.8631	+0.8665	+0.8784	+0.8796	+0.8802	+0.8791
$\gamma - \eta$	+0.0268	+0.0601	+0.2320	+0.2676	+0.4509	+0.4888
Diff.	+333		+356		+379	
ζ	+0.408	+0.420	+0.460	+0.464	+0.466	+0.463
l_1	+0.5377	+0.5377	+0.5377	+0.5377	+0.5377	+0.5377
$\zeta \tan f_1$	+0.0019	+0.0020	+0.0022	+0.0022	+0.0022	+0.0022
L_1	+0.5358	+0.5357	+0.5355	+0.5355	+0.5355	+0.5355
m	+0.5543	+0.4957	-0.0030	+0.0018	+0.0550	-0.0028
Discriminant	-0.0185	+0.0400				
G.M.T.	15 ^h 33 ^m .16		16 ^h 36 ^m .2		17 ^h 39 ^m .52	
$\pi - \xi$	-0.5341		-0.1529		+0.2225	
$\gamma - \eta$	+0.0373		+0.2541		+0.4870	
ξ	-0.2829		-0.0978		+0.0955	
η	+0.8642		+0.8791		+0.8792	
$\tan M$	-14.32		-0.602		+0.457	
$\tan C$	-0.327		-0.111		+0.109	
M	274.0		328.9		24.6	
C	341.9		353.7		6.2	
$M - C = V$	292.1		335.2		18.4	
L_1			+0.5355			
m			+0.2966			
$L_1 - m$			+0.2389			
$2L_1 - 0.5459$			+0.5251			
Magnitude			0.455			

The discriminant is $L_1 - m$ for the beginning and end of the eclipse, and

$$(\pi - \xi)\{(\pi_2 - \xi_2) - (\pi_1 - \xi_1)\} + (\gamma - \eta)\{(\gamma_2 - \eta_2) - (\gamma_1 - \eta_1)\}$$

for the middle.

If still further accuracy were required in the case of the first and last contacts, similar 5-figure calculations would be made, using as initial times 15^h 33^m, 15^h 34^m, 17^h 39^m and 17^h 40^m.

To prepare a diagram showing the appearance of the Sun as seen by the naked eye at any moment, say at the middle of the eclipse, a circle of unit radius is first

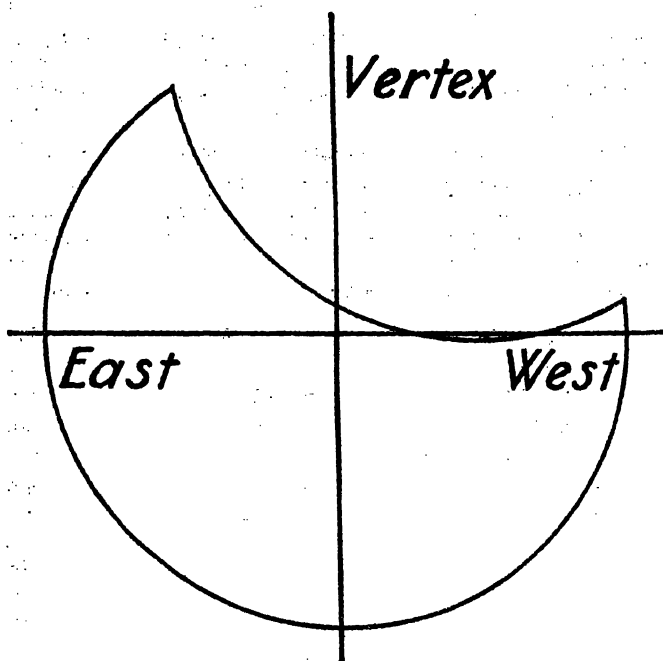
drawn to represent the Sun. The centre of the Moon is in position angle $M - C$, here 335° , reckoned from the vertex in the direction N.E.S.W., and its distance is

$$\frac{m}{L_1 - 0.273} = \frac{0.297}{0.263} = 1.13$$

The radius of the Moon is

$$\frac{0.273}{L_1 - 0.273} = \frac{0.273}{0.263} = 1.04$$

The complete drawing, as shown in the accompanying illustration, can now be made.



The position angles of the cusps, reckoned from the north point of the Sun, are given by $M \pm A$, where

$$\begin{aligned} \tan^2 \frac{A}{2} &= \frac{(L_1 - m)(m + 0.5459 - L_1)}{(L_1 + m)(m + L_1 - 0.5459)} \\ &= \frac{0.2389 \times 0.3070}{0.8321 \times 0.2862} = 0.3080 \end{aligned}$$

whence $A = 58^\circ.1$ and the required position angles are $328^\circ.9 \pm 58^\circ.1 = 27^\circ.0$ and $270^\circ.8$. The position angles from the vertex are $335^\circ.2 \pm 58^\circ.1 = 33^\circ.3$ and $277^\circ.1$.

Corrections to the Besselian Elements. It is sometimes desirable to introduce corrections to the Besselian elements, depending on revised values of the corrections $\Delta\lambda_0$ and $\Delta\lambda_1$ to the *mean* longitudes of the Sun and Moon. The corrections are first converted to corrections to the right ascension and declination as follows.

$$\begin{aligned}\Delta\alpha_0 &= 0.000282 \Delta\lambda_0 \times \text{variation per day of Sun's R.A.} \\ \Delta\delta_0 &= 0.000282 \Delta\lambda_0 \times \text{variation per day of Sun's Dec.} \\ \Delta\alpha_1 &= 0.000506 \Delta\lambda_1 \times \text{variation per hour of Moon's R.A.} \\ \Delta\delta_1 &= 0.000506 \Delta\lambda_1 \times \text{variation per hour of Moon's Dec.}\end{aligned}$$

If $\Delta\lambda_0$ and $\Delta\lambda_1$ are in seconds of arc, these corrections will be in the same units as the corresponding variations. Corrections to the *true* longitude and latitude would be converted to corrections to the right ascension and declination by

$$\begin{aligned}\cos \delta \Delta\alpha &= \cos S \cos \beta \Delta\lambda - \sin S \Delta\beta \\ \Delta\delta &= \sin S \cos \beta \Delta\lambda + \cos S \Delta\beta\end{aligned}$$

where $\sin S = \cos \lambda \sec \delta \sin \epsilon = \cos \alpha \sec \beta \sin \epsilon$, and S lies between $\pm 90^\circ$. The only elements that require alteration are x and y , to which the corrections to be applied are

$$\begin{aligned}\Delta x &= \frac{15 \cos \delta_1 (\Delta\alpha_1 - \Delta\alpha_0)}{\pi_1} \\ \Delta y &= \frac{\Delta\delta_1 - \Delta\delta_0}{\pi_1}\end{aligned}$$

Eclipses of the Moon. The *Elements and Circumstances of the Eclipse* are similar to those described for solar eclipses. The times and similar circumstances of a lunar eclipse are, of course, the same for all parts of the Earth. The times of contact are derived as follows.

Let α, δ be the right ascension and declination of the Moon M , and α', δ' the right ascension and declination of that point S towards which the centre of the Earth's shadow is directed ($\alpha' = \text{R.A. of Sun} + 12^h$, $\delta' = -\text{Sun's declination}$).

Let L be the angle between the centres of the Moon and the shadow. Then in the spherical triangle formed by joining the points M, S and the north pole P

$$\begin{aligned}\sin L \sin Q &= \cos \delta \sin(\alpha - \alpha') \\ \sin L \cos Q &= \sin \delta \cos \delta' - \cos \delta \sin \delta' \cos(\alpha - \alpha')\end{aligned}$$

where Q is the angle PSM . The problem consists of finding the times at which these equations are satisfied when the appropriate values of L (see below) are substituted in them. The equations can with sufficient accuracy be reduced to

$$\begin{aligned}L \sin Q &= (\alpha - \alpha') \cos \delta \\ L \cos Q &= \delta - \delta' + \epsilon\end{aligned}$$

where $\epsilon = \frac{\sin 2\delta \sin^2 \frac{1}{2}(\alpha - \alpha')}{\sin 1''}$ and can usually be ignored.

Let π, s = parallax and semi-diameter of the Moon

π', s' = parallax and semi-diameter of the Sun.

The shadow will differ somewhat from a cone as the Earth is not a true sphere, but it will suffice to use a mean radius for the Earth, which is equivalent to substituting for π a parallax π_1 , reduced to latitude 45° , so that $\pi_1 = 0.9983 \pi$.

Moreover, observation has shown that the Earth's atmosphere has the effect of increasing the apparent breadth of the shadow by about one-fiftieth. Hence the values of L to be substituted in the above equations will be, for first and last contacts with the penumbra

$$L = 1.02 (\pi_1 + s' + \pi') + s$$

for first and last contacts with the umbra

$$L = 1.02 (\pi_1 - s' + \pi') + s$$

and for second and third contacts with the umbra (the beginning and ending of totality)

$$L = 1.02 (\pi_1 - s' + \pi') - s$$

To solve the equations a method similar to that adopted for solar eclipses is used.

$$\begin{array}{ll} \text{Let } x = (a - a') \cos \delta & x' = \text{hourly variation of } x \\ y = \delta - \delta' + \epsilon & y' = \text{hourly variation of } y \end{array}$$

x and y are computed for several successive hours at the time of eclipse, x' and y' are found from their differences, and if x_0 and y_0 be the values of x and y at some moment T_0 near opposition, then for any particular time of contact T

$$\begin{array}{l} L \sin Q = x_0 + x' (T - T_0) \\ L \cos Q = y_0 + y' (T - T_0) \end{array}$$

Putting

$$\begin{array}{ll} m \sin M = x_0 & n \sin N = x' \\ m \cos M = y_0 & n \cos N = y' \end{array}$$

then

$$\sin \psi = \frac{m \sin(M - N)}{L}$$

and

$$T - T_0 = - \frac{m \cos(M - N)}{n} + \frac{L \cos \psi}{n}$$

$\cos \psi$ being taken with the negative sign for first contact and with the positive sign for last contact. If desired the computations may be repeated, using the times just obtained as initial times.

The time of greatest obscuration, or the middle of the eclipse, is given by

$$T_0 - \frac{m \cos(M - N)}{n}$$

The magnitude of the eclipse, the Moon's diameter being unity, is $\frac{L - \Delta}{2s}$,

where $\Delta = m \sin(M - N)$, taken positively for the time of mid-eclipse, the value of L being the mean of those used for the first and last umbral contacts.

The position angle of contact on the Moon's limb, measured from the north point in the direction N.E.S.W., is $180^\circ + N + \psi$.

The latitudes and longitudes of the places that have the Moon in the zenith at first and last umbral contacts are determined by

$$\begin{array}{l} \lambda = \text{Greenwich sidereal time} - \alpha \\ \phi = \delta \end{array}$$

For further details of eclipse prediction reference may be made to Chauvenet's *Manual of Spherical and Practical Astronomy*, to Buchanan's *Mathematical Theory of Eclipses*, and to the *Monthly Notices of the Royal Astronomical Society*, 87, 483, and 93, 175, 414 and 536.

Lunar Occultations (Pages 536-563)

The information concerning lunar occultations consists of the mean places of occultation stars (pages 536-537), reductions from mean place to apparent place (pages 538-541), elements of occultations (pages 542-555) and predictions of occultations visible at Greenwich, Edinburgh, Cape of Good Hope and Johannesburg (pages 556-563). As occultations are now used, not for the determination of longitude, but for the accurate determination of the Moon's position, elements are not given in cases where the occultation could not be observed from any fixed observatory under satisfactory conditions. They are not given within 48 hours of New Moon. Stars fainter than magnitude 5.5 are not included for 48 hours before and after Full Moon, and stars fainter than magnitude 4.5 are excluded for 24 hours before and after Full Moon. In the computation of the elements a correction of $+5''.0$ has been applied to the mean longitude of the Moon.

The list given in the *Mean Places of Occultation Stars* includes all stars of magnitude 6.5 or brighter contained in the Washington Zodiacal Catalogue (Hedrick), *Astronomical Papers of the American Ephemeris and Nautical Almanac*, Vol. VIII, Part III, that are occulted during the year, except stars whose mean places are given on pages 296-307.

The *Reductions of Occultation Stars* are the quantities to be added to the mean places of the stars in order to obtain the apparent places for the time of occultation. The numbers correspond to the numbers in the elements.

The *Elements of Occultations* furnish the means whereby the times and circumstances of occultations of stars or planets by the Moon may be predicted for any locality on the Earth. The *Limiting Parallels* are the extreme limits of latitude, north and south, between which the path of the Moon's shadow across the Earth will lie. Owing to the varying inclination of the shadow path to the equator it does not follow that an occultation will necessarily be visible even if the observer is situated within these limits.

The Besselian elements of the occultation for the moment of geocentric conjunction of the star and Moon in right ascension are similar to those already described for solar eclipses. In occultations the fundamental plane passes through the centre of the Earth and is at right angles to the line joining the star and the centre of the Moon. Owing to the distance of the star the Moon's shadow becomes a cylinder whose intersection with the fundamental plane is a circle of invariable size, its diameter being equal to that of the Moon. The value used in occultations for the ratio k of the Moon's radius to the Earth's equatorial radius is 0.2725. This value is somewhat larger than that used for eclipses because the eclipse diameter is based on the disappearance of the last Baily's bead, and therefore represents the diameter between the lowest portions of the lunar valleys, whilst an occultation of a star can take place at any point between the summit of a lunar mountain and the lower portion of a lunar valley.

The formulæ for x and y , the co-ordinates of the centre of the shadow on the fundamental plane, are

$$x = \frac{\cos \delta_{\epsilon} \sin(\alpha_{\epsilon} - \alpha_{*})}{\sin \pi}$$

$$y = \frac{\sin \delta_{\epsilon} \cos \delta_{*} - \cos \delta_{\epsilon} \sin \delta_{*} \cos(\alpha_{\epsilon} - \alpha_{*})}{\sin \pi}$$

where π is the Moon's horizontal parallax. These may be reduced, with sufficient accuracy, to

$$x = \frac{15 \cos \delta_{\epsilon} (\alpha_{\epsilon} - \alpha_{*})}{\pi} \quad y = \frac{\delta_{\epsilon} - \delta_{*}}{\pi}$$

where $\alpha_{\epsilon} - \alpha_{*}$ is in seconds of time, and $\delta_{\epsilon} - \delta_{*}$ and π are in seconds of arc.

At the moment of conjunction of the star and Moon in right ascension the co-ordinate x will be zero and the Besselian elements tabulated are

T_0 = Greenwich mean time of conjunction

H = Greenwich hour angle of the star at that moment, reckoned positively towards the west and negatively towards the east

Y = value of the co-ordinate y at the moment of conjunction

x', y' = variations of x and y in one hour of mean time.

The value of T_0 is obtained by inverse interpolation in the Moon's hourly ephemeris to obtain the moment when the right ascension of the Moon is equal to that of the star. H is derived from

$$H = \text{Greenwich sidereal time of conjunction} - \alpha$$

where α is the common right ascension of the star and Moon.

At the present time the observed mean longitude of the Moon is in excess of the tabular mean longitude by about 5", and to correct for this the values of T_0 and H as derived from the Moon's ephemeris are adjusted by the addition of $-0^m.15$.

The values of x' and y' are derived from

$$x' = \frac{15 \cos \delta_{\epsilon} \Delta \alpha_{\epsilon}}{\pi} \quad y' = \frac{\Delta \delta_{\epsilon}}{\pi}$$

where $\Delta \alpha_{\epsilon}$ and $\Delta \delta_{\epsilon}$ are the variations per hour of the Moon's right ascension and declination.

An alternative method of calculating the above elements consists in computing x and y for the integral hour T_1 before and the integral hour T_2 after conjunction, thus avoiding interpolation of α_{ϵ} and δ_{ϵ} . Calling these x_1, y_1 and x_2, y_2

$$x' = x_2 - x_1 \quad y' = y_2 - y_1$$

$$T_0 = T_1 - \frac{x_1}{x'} - 0^m.15$$

$$Y = y_1 - \frac{x_1}{x'} y'$$

$$H = \text{sidereal time at } 0^h + \text{sidereal equivalent of } T_0 - \alpha_{*}$$

The limiting parallels ϕ_1 and ϕ_2 are derived from the following formulæ*, in which the declination of the star is denoted by δ .

$$\begin{aligned}\tan N &= \frac{x'}{y'} && (N \text{ less than } 90^\circ) \\ \cos \gamma_1 &= Y \sin N + 0.2725 && (\gamma_1 \text{ less than } 180^\circ) \\ \cos \gamma_2 &= Y \sin N - 0.2725 && (\gamma_2 \text{ less than } 180^\circ) \\ \sin \beta &= \sin N \cos \delta && (\beta \text{ less than } 90^\circ)\end{aligned}$$

Then, for northern declinations

- | | |
|--|--|
| (1) If $\cos \gamma_2$ is greater than $\sin \beta$ | $\phi_1 = \beta + \gamma_2$ |
| (2) If $\cos \gamma_2$ is less than $\sin \beta$ and | |
| (a) γ_1 is imaginary | $\phi_1 = +90^\circ$ |
| (b) $\cos \gamma_1$ is greater than $\sin \beta$ | $\phi_1 = +90^\circ$ |
| (c) $\cos \gamma_1$ is less than $\sin \beta$ | $\phi_1 = 180^\circ - \beta - \gamma_1$ |
| (3) If $\cos \gamma_2$ is greater than $-\sin N$ | $\sin \phi_2 = \sin(N - \gamma_2) \cos \delta$ |
| (4) If $\cos \gamma_2$ is less than $-\sin N$ | $\phi_2 = -(90^\circ - \delta)$ |
| (5) If γ_2 is imaginary and | |
| (a) $\cos \gamma_1$ is greater than $-\sin N$ | $\phi_2 = -(90^\circ - \delta)$ |
| (b) $\cos \gamma_1$ is less than $-\sin N$ | $\sin \phi_2 = \sin(N - \gamma_1) \cos \delta$ |

For southern declinations

- | | |
|--|--|
| (1) If $\cos \gamma_1$ is less than $-\sin \beta$ | $\phi_2 = \gamma_1 - \beta - 180^\circ$ |
| (2) If $\cos \gamma_1$ is greater than $-\sin \beta$ and | |
| (a) γ_2 is imaginary | $\phi_2 = -90^\circ$ |
| (b) $\cos \gamma_2$ is less than $-\sin \beta$ | $\phi_2 = -90^\circ$ |
| (c) $\cos \gamma_2$ is greater than $-\sin \beta$ | $\phi_2 = \beta - \gamma_2$ |
| (3) If $\cos \gamma_1$ is less than $\sin N$ | $\sin \phi_1 = \sin(N + \gamma_1) \cos \delta$ |
| (4) If $\cos \gamma_1$ is greater than $\sin N$ | $\phi_1 = 90^\circ + \delta$ |
| (5) If γ_1 is imaginary and | |
| (a) $\cos \gamma_2$ is less than $\sin N$ | $\phi_1 = 90^\circ + \delta$ |
| (b) $\cos \gamma_2$ is greater than $\sin N$ | $\sin \phi_1 = \sin(N + \gamma_2) \cos \delta$ |

Predictions of Occultations visible at Greenwich, Edinburgh, Cape of Good Hope and Johannesburg are given on pages 556-563, while, by means of the longitude and latitude coefficients a and b , the times given may be adjusted for neighbouring observatories.

Predictions for a number of stars in addition to those whose Besselian elements are given on pages 542-555 are included, the supplementary list comprising, *inter alia*, the remainder of the fainter stars in the Washington Zodiacal Catalogue (Hedrick).

The following limitations have been imposed:—

- (1) The star is at least 10° above the horizon at the time given.
- (2) Except for bright stars and planets no occultations are given that would occur in daylight or bright twilight.
- (3) In the case of stars fainter than magnitude 6.5 a progressive restriction, depending upon the magnitude of the star, has been imposed during the period from one day before last quarter to one day after first quarter, to which period the predictions for these stars are limited.

*These formulæ replace those of Chauvenet, which are very incompletely stated.

- (4) Bright limb phenomena are given only in the case of stars of magnitude 3.5 or brighter for reappearances, and of magnitude 4.5 or brighter for disappearances.

The approximate time of occultation at a place $\Delta\lambda$ degrees west and $\Delta\phi$ degrees north of one of the stations for which particulars are given may be obtained from

$$\text{Approximate time} = \text{predicted G.M.T.} + a \Delta\lambda + b \Delta\phi$$

For example. if the time of occultation of 17 Tauri on January 14 is required for Stonyhurst College Observatory it may be obtained from the predicted particulars for either Edinburgh or Greenwich.

	From Edinburgh		From Greenwich	
	$\Delta\lambda = -0^{\circ}.7$		$\Delta\lambda = +2^{\circ}.5$	
	$\Delta\phi = -2^{\circ}.1$		$\Delta\phi = +2^{\circ}.4$	
Predicted G.M.T. ...	^h 16	^m 58	^h 16	^m 50
$a \Delta\lambda$...	+	0.3	-	1.5
$b \Delta\phi$...	-	4.6	+	4.6
G.M.T. at Stonyhurst	16	53.5	16	53

The particulars for the nearer station will usually be used, but the mean of the times obtained from both stations may be employed in the case of places situated in the Midlands or Northern England.

For distances up to 300 miles the error of this formula will not, in general, exceed 2^m. In the case of grazing or brief occultations where linear variations cannot be used with safety, the coefficients have been omitted. The times are given to the nearest half minute only. The column headed *P* gives the position angle of the star at the time given, measured from the north point of the Moon in the direction N.E.S.W.

The formulæ used in the predictions are similar to those for solar eclipses. The co-ordinates on the fundamental plane of the centre of the shadow are denoted by x and y and those of the observer by ξ and η . When the distance between the observer and the centre of the shadow is equal to k an occultation will be beginning or ending. This leads to the fundamental equation

$$(x - \xi)^2 + (y - \eta)^2 = k^2$$

which has two real roots (or none) corresponding to immersion and emersion.

The predictions of occultations for Greenwich and Edinburgh form part of a general scheme of prediction for eight stations,* which with the a and b coefficients cover the greater part of northern and western Europe. Preliminary times are obtained for four of these stations by an adaptation of the principles involved in the graphical method of Father Rigge,† and after these times have been corrected preliminary times for the remaining stations are obtained by means of the a and b coefficients. The preliminary times are corrected differentially as follows.

* The other stations are Paris (published in the *Connaissance des Temps*), Berlin, Munich and Königsberg (published in the *Berliner Jahrbuch*), Brussels (published in *Annuaire de l'Observatoire Royal de Belgique*), and Copenhagen (published in *Nordisk Astronomisk Tidsskrift*).

† *The Graphic Construction of Eclipses and Occultations*, Loyola University Press, Chicago, 1924.

Let T = preliminary time
 T_0 = time of conjunction
 $t = T - T_0$

whence $x = x't \quad y = Y + y't$
 $\xi = \rho \cos \phi' \sin h$
 $\eta = \rho \sin \phi' \cos \delta - \rho \cos \phi' \cos h \sin \delta = \eta_1 - Q \sin \delta$
 $x - \xi = f \quad y - \eta = g$

where δ is the declination of the star and $h = H - \lambda + t_s, t_s$ being the sidereal equivalent of t .

If the time used is the true time of occultation the value of $f^2 + g^2$ will be 0.2725^2 or 0.07426 . If $f^2 + g^2$ exceeds or falls short of this constant the true time of occultation will be later or earlier than the assumed time if the phase concerned is a disappearance, the reverse being the case for a reappearance. The correction to the assumed time is

$$\pm \frac{30(f^2 + g^2 - k^2)}{kn \cos \psi} \text{ minutes}$$

where the upper and lower signs apply to immersion and emersion respectively, and where

$$a_0 = fQ + g\xi \sin \delta$$

$$kn \cos \psi = fx' + gy' - 0.2625 a_0$$

The coefficients a and b are given by

$$p = C^2 \rho \sin \phi' \sin h$$

$$q = C^2 \rho \sin \phi' \cos h$$

$$r = SC \rho \cos \phi' \cos \delta$$

$$b_0 = fp - gq \sin \delta - gr$$

$$J = \pm \frac{60^3 \sin 1''}{kn \cos \psi}$$

$$a = Ja_0 \quad b = Jb_0$$

the upper and lower signs relating to immersion and emersion respectively, and S and C being tabulated in Table X.

The position angle P , measured from the north point of the Moon's disc in the direction N.E.S.W., is given by

$$\sin P = -\frac{f}{k} \quad \cos P = -\frac{g}{k} \quad \text{or} \quad \tan P = \frac{f}{g}$$

If the preliminary time is more than $0^m.5$ in error the corrected time is used as the starting point of a fresh calculation. The reason for this is that the functions entering into the formulæ for a , b and P are implicitly assumed to relate to the true times of immersion and emersion. The calculations are made to three significant figures and in practice all the quantities used are obtained from simple prepared tables, the multiplications being performed by means of Crelle's tables or a small calculating machine.

Ephemeris for Physical Observations of the Sun (Pages 564-567)

P = position angle of the axis of rotation, measured eastward from the north point of the disc

B_0 = heliographic latitude of the centre of the disc

L_0 = heliographic longitude of the centre of the disc.

Heliographic longitudes are reckoned from the solar meridian that passed through the ascending node of the Sun's equator on the ecliptic on 1854 January 1, Greenwich mean noon* (= J.D. 239 8220.0).

In the computation of the ephemeris the following elements by Carrington have been used:—

I = inclination of the Sun's equator to the ecliptic = $7^\circ 15'$

Ω = longitude of the ascending node of the Sun's equator on the ecliptic
= $73^\circ 40' + 50'' \cdot 25 (t - 1850)$

Sidereal period of rotation (mean solar days) = $25^d \cdot 38$

It will be noticed that no allowance is made for the change in the plane of the ecliptic. The mean synodic rotation period is $27^d \cdot 2753$.

If λ is the longitude of the Sun

$$\tan x = -\tan \epsilon \cos(\text{Sun's apparent longitude})$$

$$\tan y = -\tan I \cos(\lambda - \Omega)$$

$$P = x + y$$

$$\sin B_0 = \sin I \sin(\lambda - \Omega)$$

$$\tan L = \cos I \tan(\lambda - \Omega)$$

$$L_0 = L \pm 180^\circ - \frac{360^\circ}{25 \cdot 38} \times \text{days elapsed since 1854 Jan. 1.0}$$

x , y and B_0 being taken between the limits $\pm \epsilon$, $\pm I$ and $\pm I$ respectively, and L in the same quadrant as $\lambda - \Omega$.

The equinox of λ is immaterial provided that Ω is referred to the same equinox. It is therefore convenient to refer λ to the equinox of 1950.0, using the values on pages 38-45, and then Ω becomes a constant. For working purposes the formulæ may be written

$$\tan x = -\tan \epsilon \cos(\text{Sun's apparent longitude})$$

$$\tan y = -0.12722 \cos(\lambda - 75^\circ \cdot 063)$$

$$P = x + y$$

$$\sin B_0 = 0.12620 \sin(\lambda - 75^\circ \cdot 063)$$

$$\tan L = 0.99200 \tan(\lambda - 75^\circ \cdot 063)$$

$$\text{or } \cot L = 1.00806 \cot(\lambda - 75^\circ \cdot 063)$$

$$L_0 = L + 112^\circ \cdot 766 + 14^\circ \cdot 18439 716 (243 0000.5 - \text{J.D.})$$

The formula for $\tan L$ or $\cot L$ is used according as $\tan(\lambda - 75^\circ \cdot 063)$ is numerically less than or greater than 1.

The value of L_0 at any given G.M.T. may be found by subtracting from the tabulated value for 0^h the amount given by the following table.

* This is the definition of heliographic longitude that has always been used in the *Nautical Almanac*, although Carrington's zero meridian passed the ascending node twelve hours earlier than the above.

TABLE FOR INTERPOLATION OF L_0

Daily movement of L_0				For all values of the daily movement of L_0							
	$^{\circ}$ 13.16	$^{\circ}$ 13.19	$^{\circ}$ 13.22								
	13.17	13.20	13.23								
	13.18	13.21	13.24								
h	$^{\circ}$	$^{\circ}$	$^{\circ}$	m	$^{\circ}$	m	$^{\circ}$	m	$^{\circ}$	m	$^{\circ}$
0	0.00	0.00	0.00	00	0.00	20	0.18	40	0.37		
1	0.55	0.55	0.55	01	.01	21	.19	41	.38		
2	1.10	1.10	1.10	02	.02	22	.20	42	.38		
3	1.65	1.65	1.65	03	.03	23	.21	43	.39		
4	2.20	2.20	2.20	04	.04	24	.22	44	.40		
5	2.74	2.75	2.76	05	0.05	25	0.23	45	0.41		
6	3.29	3.30	3.31	06	.06	26	.24	46	.42		
7	3.84	3.85	3.86	07	.06	27	.25	47	.43		
8	4.39	4.40	4.41	08	.07	28	.26	48	.44		
9	4.94	4.95	4.96	09	.08	29	.27	49	.45		
10	5.49	5.50	5.51	10	0.09	30	0.28	50	0.46		
11	6.04	6.05	6.06	11	.10	31	.28	51	.47		
12	6.59	6.60	6.61	12	.11	32	.29	52	.48		
13	7.13	7.15	7.17	13	.12	33	.30	53	.49		
14	7.68	7.70	7.72	14	.13	34	.31	54	.50		
15	8.23	8.25	8.27	15	0.14	35	0.32	55	0.50		
16	8.78	8.80	8.82	16	.15	36	.33	56	.51		
17	9.33	9.35	9.37	17	.16	37	.34	57	.52		
18	9.88	9.90	9.92	18	.16	38	.35	58	.53		
19	10.43	10.45	10.47	19	.17	39	.36	59	.54		
20	10.98	11.00	11.02	20	0.18	40	0.37	60	0.55		
21	11.52	11.55	11.58								
22	12.07	12.10	12.13								
23	12.62	12.65	12.68								
24	13.17	13.20	13.23								

It is found convenient for certain classes of observation to number the synodic rotations in continuation of Carrington's (Greenwich Photo-Heliographic) series, of which No. 1 commenced on 1853 November 9. The rotations commencing in 1935 are

Rotation No.	Date of commencement	Rotation No.	Date of commencement
1088	Jan. 13.19	1095	July 23.04
1089	Feb. 9.53	1096	Aug. 19.27
1090	Mar. 8.86	1097	Sept. 15.52
1091	Apr. 5.16	1098	Oct. 12.80
1092	May 2.42	1099	Nov. 9.10
1093	May 29.64	1100	Dec. 6.41
1094	June 25.84	1101	Dec. 33.74

Ephemeris for Physical Observations of the Moon (Pages 568-577)

Selenographic longitudes are measured in the plane of the Moon's equator, the axis of reference being the radius of the Moon that passes through the mean centre of the visible disc. The axis therefore rotates with the Moon, and is not fixed in space. The positive direction of measurement is towards the west, i.e. towards *Mare Crisium*.

Selenographic latitudes are measured from the Moon's equator, positively towards the north, i.e. in the hemisphere containing *Mare Serenitatis*.

The *Earth's Selenographic Longitude and Latitude* are the selenographic co-ordinates of the centre of the disc as seen from the centre of the Earth. They are the sums of the optical and physical librations in longitude and latitude respectively.

The optical libration in longitude arises principally from the fact that, while the Moon's rotation on its axis is practically uniform, its angular velocity round the Earth is not uniform, since it moves in an elliptical orbit. The optical libration in latitude is due to the fact that the plane of the Moon's equator does not coincide with the plane of the orbit. At one time the northern pole of the Moon is presented to the Earth, while half a nodical month later the southern pole will be presented to approximately the same extent.

The *Physical Librations* arise because (i) the inclination of the Moon's equator to the Moon's orbit is not strictly constant (ii) the longitude of the ascending node of the Moon's equator on the ecliptic varies slightly on either side of the descending node of the Moon's orbit on the ecliptic and (iii) the rotation of the Moon on its axis is not absolutely uniform. These perturbations are due to the fact that the Moon's moments of inertia about three principal axes, two in the plane of the equator and the third coincident with the axis of rotation, are not the same.

When the libration in longitude, or the Earth's selenographic longitude, is positive the mean centre of the disc is displaced towards the east, thus exposing to view a region on the west limb. When the libration in latitude, or the Earth's selenographic latitude, is positive the mean centre of the disc is displaced towards the south, and a region on the north limb is exposed to view.

The *Sun's Selenographic Colongitude* is 90° (or 450°) minus the Sun's selenographic longitude, and has, together with the *Sun's Selenographic Latitude*, been corrected for the effect of physical libration. It is numerically equal to the selenographic longitude of the morning terminator reckoned eastward from the mean centre of the disc. Hence its value is approximately 270° , 0° , 90° and 180° at New Moon, First Quarter, Full Moon and Last Quarter respectively. The longitude of the evening terminator differs by 180° from that of the morning terminator.

The *Position Angle of the Moon's Axis* is the angle that the lunar meridian through the centre of the visible disc makes with the declination circle through the same point. It has been corrected for the effect of physical libration.

The *Position Angle of the Terminator* is the position angle of the northern cusp, or the angle that the line joining the cusps makes with the declination circle through the centre of the Moon.

The *Fraction Illuminated* is equal to the fraction of the area of the Moon's disc illuminated, and also to the illuminated fraction of the diameter at right angles to the line of cusps.

The terminator is a semi-ellipse whose major axis is the line of cusps (i.e. the position angle of the major axis is the position angle of the terminator) and whose

semi-minor axis is equal to the semi-diameter multiplied by twice the difference between 0.50 and the fraction illuminated.

The formulæ used in computing the librations are given below. The value of I and the formulæ for physical libration are those given by Hayn in *Abhandlungen der Königlichen Sächsischen Gesellschaft der Wissenschaften*, 29 and 30 (1904 and 1907). The quantities i , Δ , Ω' , Γ' , Ω , ζ and I have already been defined on page 787. In addition

$$\begin{aligned} g &= \text{Moon's mean anomaly} = \zeta - \Gamma' \\ g' &= \text{Sun's mean anomaly} \\ \lambda, \beta &= \text{longitude and latitude of the Moon} \\ \alpha, \delta &= \text{right ascension and declination of the Moon} \\ l', b' &= \text{optical librations in longitude and latitude} \\ l'', b'' &= \text{physical librations in longitude and latitude} \\ l = l' + l'' &= \text{Moon's libration in longitude} \\ &= \text{Earth's selenographic longitude} \\ b = b' + b'' &= \text{Moon's libration in latitude} \\ &= \text{Earth's selenographic latitude} \\ l_{\odot}, b_{\odot} &= \text{Sun's selenographic longitude and latitude} \\ C' &= \text{position angle of Moon's axis, without physical libration} \\ C'' &= \text{physical libration of the Moon's axis} \\ C = C' + C'' &= \text{position angle of the Moon's axis.} \end{aligned}$$

Then

$$\begin{aligned} \sin \mu &= \tan^2 \frac{1}{2} I \sin 2(\lambda - \Omega) \\ A &= \sin I \cos(\lambda - \Omega) \\ \tan B &= -\tan I \sin(\lambda - \Omega) \end{aligned}$$

μ , A and B are tabulated on pages 568–569 with argument $\lambda - \Omega$.

$$\begin{aligned} l' &= \lambda + \mu + Ab' - \zeta \\ b' &= B - \beta \\ \sin C' &= \sin i \cos(l' + \Delta + \zeta - \Omega) \sec \delta \\ &= -\sin i \cos(\alpha - \Omega') \sec b' \end{aligned}$$

If

$$\begin{aligned} M &= 0^{\circ}.040 \sin(\Gamma' - \Omega) - 0^{\circ}.003 \sin(\zeta - \Omega) \\ N &= 0^{\circ}.020 \cos(\Gamma' - \Omega) + 0^{\circ}.003 \cos(\zeta - \Omega) \end{aligned}$$

then

$$\begin{aligned} l'' &= 0^{\circ}.003 \sin g - 0^{\circ}.016 \sin g' - 0^{\circ}.005 \sin 2(\Gamma' - \Omega) + C'' \sin b' \\ b'' &= M \cos l' + N \sin l' \\ C'' &= (M \sin l' - N \cos l') \sec b' \end{aligned}$$

The quantities $\cos l'$ and $\sec b'$ may be taken as 1, and the term $C'' \sin b'$ may be taken as $0.018 C'' \times b'$ in degrees.

When the values of λ , β , α and δ used in the above formulæ represent the geocentric co-ordinates of the Moon the resulting values of l , b and C will apply to the centre of the earth. To obtain the values applicable to an observer on the surface of the Earth the apparent co-ordinates of the Moon must be used. It will be found best to correct α and δ for parallax and then obtain the apparent longitude and latitude by conversion of the apparent right ascension and declination in the usual manner. The geocentric physical libration may be used unaltered.

The Sun's selenographic longitude and latitude are computed from similar formulæ in which the heliocentric co-ordinates of the Moon have been substituted for the geocentric co-ordinates.

If

 λ_{\odot} = Sun's true longitude referred to true equinox

= mean longitude referred to equinox of 1935.0 + precession + nutation

 R = radius vector of the Sun π = Moon's equatorial horizontal parallax in minutes of arc λ_{H} = Moon's heliocentric longitude β_{H} = Moon's heliocentric latitude

then

$$\lambda_{\text{H}} = \lambda_{\odot} + 180^{\circ} + \frac{8.80 \times 57.296}{60 \pi R} \cos \beta \sin(\lambda_{\odot} - \lambda)$$

$$= \lambda_{\odot} + 180^{\circ} + F_0 F_1 \sin(\lambda_{\odot} - \lambda)$$

$$\beta_{\text{H}} = \frac{8.80 \beta}{60 \pi R} = F_0 \beta$$

 β F_1

0.00

57.3

2.29

57.2

4.08

57.1

5.31

where $F_0 = \frac{8.80}{60 \pi R}$ and can be tabulated in a double entrytable for every minute of π and every tenth day of the year.
 $F_1 = 57.296 \cos \beta$ and is given in the accompanying critical table. A , B and μ are found from the table on pages 568-569 with argument $\lambda_{\text{H}} - \Omega$ and then

$$l'_{\odot} = \lambda_{\text{H}} + \mu + Ab'_{\odot} - \zeta$$

$$b'_{\odot} = B - \beta_{\text{H}}$$

$$l''_{\odot} = 0^{\circ}.003 \sin g - 0^{\circ}.016 \sin g' - 0^{\circ}.005 \sin 2(\Gamma' - \Omega) \\ + (M \sin l'_{\odot} - N \cos l'_{\odot}) \tan b'_{\odot}$$

$$b''_{\odot} = M \cos l'_{\odot} + N \sin l'_{\odot}$$

For the position angle T of the terminator and F , the fraction illuminated, two sets of formulæ are employed, as T cannot be checked near New Moon and Full Moon by the usual process of differencing.

$$\tan N = \frac{\tan \delta_{\odot}}{\cos(a_{\odot} - a)}$$

 N being taken between the limits $\pm 90^{\circ}$.

$$\tan T = \cot(a_{\odot} - a) \sin(\delta - N) \sec N$$

 T being taken between the limits $\pm 90^{\circ}$.

$$f = \cos(a_{\odot} - a) \cos \delta_{\odot} \cos(\delta - N) \sec N$$

$$F = \frac{1}{2}(1 - f)$$

The alternative formula for T is

$$\tan M = \frac{\tan b_{\odot}}{\sin(c_{\odot} + l)}$$

where c_{\odot} is the Sun's selenographic colongitude and M is taken between the limits $\pm 90^{\circ}$.

$$\tan(T - C) = \tan(c_{\odot} + l) \sin(M - b) \sec M$$

 $T - C$ being taken between the limits $\pm 90^{\circ}$.

$$T = C + (T - C)$$

Occasionally near New Moon or Full Moon this formula will yield the position angle of the southern cusp, i.e. an angle between 90° and 270° , in which case 180° must be added or subtracted.

It would be possible to compute f from

$$f = -\sin(c_0 + l) \cos b_0 \cos(M - b) \sec M$$

but in practice it is better to use

$$F = \text{haversine}(\lambda_0 - \lambda) = \text{haversine}(\lambda - \lambda_0)$$

which neglects the Moon's latitude, and is thus not strictly accurate, but serves as a check. The maximum error, at New or Full Moon, is 0.002, the value tending to be too small before First Quarter and too large after. It should be noted that the values published are geocentric, and may differ somewhat from those observed from the Earth's surface.

The Sun's altitude A at a point on the Moon in selenographic longitude λ_0 and latitude β_0 may be found from

$$\sin A = \sin b_0 \sin \beta_0 + \cos b_0 \cos \beta_0 \sin(c_0 + \lambda_0)$$

The position of the point may be defined by means of its direction cosines ξ, η, ζ , the axis of ξ being that diameter of the Moon's equator which is 90° from the mean centre of the disc, and the positive direction being towards the west (i.e. as seen in the sky, not by an observer on the Moon), the axis of η being the Moon's polar axis, positive towards the north, and the axis of ζ the diameter through the mean centre of the disc. Then

$$\sin A = \xi \cos c_0 \cos b_0 + \eta \sin b_0 + \zeta \sin c_0 \cos b_0$$

Neither formula is convenient when the Sun's altitude is very great, for an angle near 90° cannot easily be determined accurately from its sine. However, when the Sun is high it is not necessary to compute its altitude with great accuracy, as the shadows are then inconspicuous.

An ephemeris of the crater Mösting A is given each year in the *Berliner Jahrbuch*.

Illuminated Discs of Mercury and Venus (Pages 578–579)

The notation is explained on pages 578–579. θ is the position angle of the arc of the great circle from the planet to the Sun increased by 90° . If on the disc of the planet an arrow be drawn towards position angle θ , the illuminated portion of the disc will be on the right of the arrow. When θ is less than 180° the north limb of the planet is full; when greater the south limb. When θ is between 90° and 270° limb II, i.e. the following or east limb, is full. The position angle of the direction of greatest defect of illumination is $\theta + 90^\circ$.

The terminator is a semi-ellipse whose major axis is a diameter of the planet in position angle θ and whose semi-minor axis is of length S.D. \times (twice the difference between k and 0.500) in position angle $\theta - 90^\circ$ when k is less than 0.5, and $\theta + 90^\circ$ when k is greater than 0.5.

When i is greater than 90° , k is less than 0.5, i.e. the planet is horned, and the correction of an observation of the cusp for defective illumination in declination is S.D. $\times (1 \pm \cos \theta)$, the sign being so taken as to make the quantity within the bracket less than unity.

When i is less than 90° , k is greater than 0.5, i.e. the planet is gibbous. If angles ϕ and ψ (in the first quadrant) are found from

$$\sin \phi = \sin i \cos \theta$$

$$\sin \psi = \sin i \sin \theta$$

the correction for defective illumination in right ascension is

Sidereal time of S.D. passing meridian $\times (1 - \cos \phi)$

and that in declination is S.D. $\times (1 - \cos \psi)$. When the corrections are very small they are sensibly equal to

Sidereal time of S.D. passing meridian $\times \frac{1}{2} \sin^2 i \cos^2 \theta$

and S.D. $\times \frac{1}{2} \sin^2 i \sin^2 \theta$

Using α and δ for the co-ordinates of the planet:—

$$\sin D \sin \theta = \cos \delta \sin \delta_0 - \sin \delta \cos \delta_0 \cos(\alpha - \alpha_0)$$

$$\sin D \cos \theta = \cos \delta_0 \sin(\alpha - \alpha_0)$$

in which $\sin D$ is always positive, as D is the elongation of the planet from the Sun, and is less than 90° .

$$\sin i = \frac{R \sin D}{r} = \frac{R \cos \delta_0 \sin(\alpha - \alpha_0) \sec \theta}{r}$$

R and r being the radii vectores of the Earth and planet respectively.

If i is near 90° it is not easily determined from its sine. In that case

$$\sin S = \frac{\Delta \sin D}{r} = \frac{\Delta \cos \delta_0 \sin(\alpha - \alpha_0) \sec \theta}{r}$$

Δ being the distance of the planet from the Earth and S being in the first quadrant in all cases where it is necessary to use it. Then

$$i = 180^\circ - D - S$$

$$h = \frac{1}{2}(1 + \cos i) = 1 - \text{haversine } i$$

The *Brilliancy of the Disc* is really the brightness as compared with that of a fictitious planet of semi-diameter r'' , situated at unit distance from the Sun and at the same distance from the Earth as the planet, and supposed to be fully illuminated and to have the same albedo as the planet. Hence

$$L = \frac{s^2 h}{r^2}$$

where s = semi-diameter. With the adopted values $3''.34$ and $8''.41$ of the semi-diameters at unit distance

$$L = \frac{11.16 h}{r^2 \Delta^2} \quad \text{for Mercury}$$

$$= \frac{70.73 h}{r^2 \Delta^2} \quad \text{for Venus.}$$

The *Stellar Magnitudes* are computed from Müller's formulæ:—

$$\text{For Mercury} \quad +1.16 + 5 \log r\Delta + 0.02838 (i - 50^\circ) + 0.00010 23 (i - 50^\circ)^2$$

$$\text{For Venus} \quad -4.00 + 5 \log r\Delta + 0.01322 i + 0.00000 04247 i^2$$

where i is measured in degrees.

Ephemeris for Physical Observations of Mars (Pages 580–585)

The *Light-Time* is the time taken by light to travel from the planet to the Earth, the time required to travel unit distance being taken as $498^s.58$.

The *Stellar Magnitude* is based on Müller's formula

$$-1.30 + 5 \log r\Delta + 0.01486 i$$

where i is measured in degrees.

- P = position angle of the axis of rotation, measured eastward from the north point of the disc
- A_{\odot} , A_0 = areocentric right ascension of the Earth and Sun respectively, measured in the plane of the planet's equator from its vernal equinox
- D_{\odot} , D_0 = areocentric declinations of the Earth and Sun respectively, referred to the planet's equator
- \odot_s = areocentric longitude of the Sun, measured in the plane of the planet's orbit from its vernal equinox
- k = ratio of the area of the illuminated portion of the apparent disc to the area of the entire apparent disc regarded as circular
- i = angle between the Sun and Earth as seen from Mars
- q = angular value of the greatest defect of illumination as seen from the Earth
- Q = position angle of the point of greatest defect of illumination, measured from the north point of the disc. The position angle of the line of cusps is $Q \pm 90^\circ$.

The *Diameter* is based on a diameter at unit distance of $9''.36$.

The column *Central Meridian* gives the longitude of the meridian that passes through the centre of the disc, measured from the adopted zero meridian. No correction is made for phase.

The column *G.M.T. of Transit of Zero Meridian* gives the G.M.T. of every transit of the zero meridian across the actual centre of the disc.

All the above quantities have been corrected for aberration, so that in using them they should be interpolated to the actual time of observation.

The assumed position of the north pole of Mars at the beginning of year t is

$$\alpha_0 = 21^h 10^m 00^s + 1^s.565 (t - 1905.0)$$

$$\delta_0 = 54^\circ 30' 00'' + 12''.60 (t - 1905.0)$$

as given by Lowell and Crommelin (*M.N.R.A.S.*, 66, 56). The zero meridian may be defined by adopting as the longitude of the central meridian on 1897 May 15.0 G.M.T. the value $52^\circ.01$, as given by Marth (*M.N.R.A.S.*, 56, 403). However, on account of changed values for the position of the axis of Mars, the ephemeris is actually calculated on the assumption that the longitude of the central meridian on 1909 January 15.0 was $344^\circ.41$, as given in the *Nautical Almanac*, and based on the present value of the position of the axis. The daily motion in longitude of the zero meridian is taken as $350^\circ.89202$, which corresponds to a period of rotation of $24^h 37^m 22^s.654$. The daily motion and period of rotation are regarded as being relative to the planet's true equinox; in other words the period is the Martian sidereal day, and differs slightly from the true period of axial rotation on account of a slight precession of the Martian equinoxes.

The formulæ on which the ephemeris is based are given below. In addition to the quantities already defined

α , δ , Δ = geocentric equatorial co-ordinates of Mars

l , b , r = heliocentric ecliptic co-ordinates of Mars

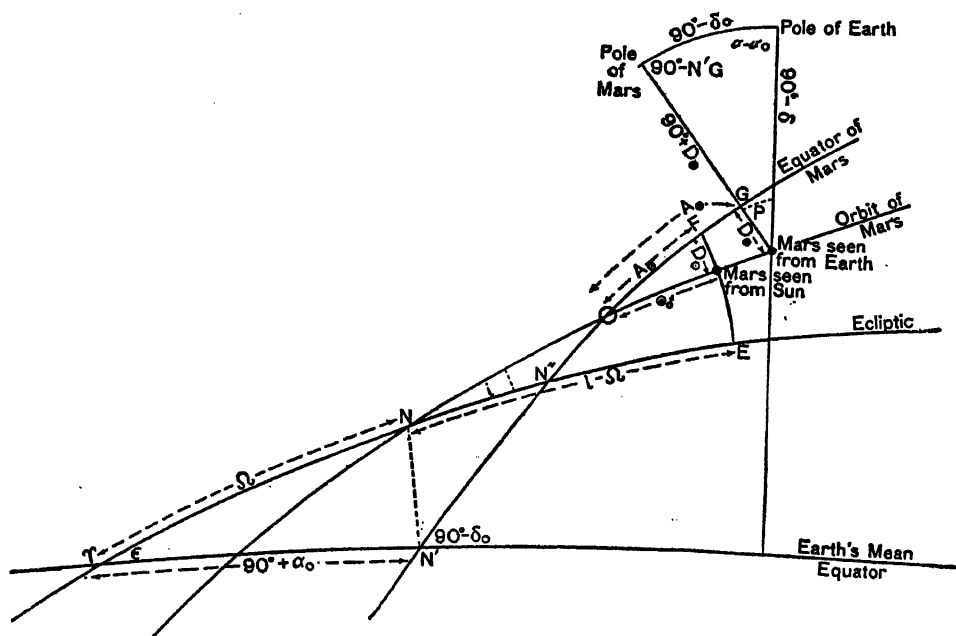
Ω , i = node and inclination to the ecliptic of the orbit of Mars

ϵ = mean obliquity.

In the diagram, which shows the projections on the celestial sphere of the four planes involved, O is the ascending node of the equator of Mars on the orbit of Mars,

EXPLANATION, 1935

i.e. the planet's autumnal equinox. The geocentric or heliocentric longitude of Mars measured in the plane of its equator from this autumnal equinox will be the same as the areocentric right ascension of the Earth or Sun respectively, measured in the same plane from the vernal equinox. The geocentric or heliocentric declinations of Mars measured from the plane of the planet's equator will be the same numerically as the areocentric declinations of the Earth and Sun respectively, but will be reversed in sign.



The ascending node of the equator of Mars on the Earth's mean equator will be in R.A. $90^\circ + \alpha_0$, and the inclination of the two equators will be $90^\circ - \delta_0$.

The adopted values of Ω and i are taken from Newcomb's orbit of Mars, with Ross's corrections

$$\begin{aligned}\Omega &= 48^\circ 47' 11''.19 + 2775''.57 T - 0''.005 T^2 - 0''.0192 T^3 \\ i &= 1^\circ 51' 01''.20 - 2''.430 T + 0''.0454 T^2\end{aligned}$$

where T is measured in Julian centuries from 1900 January 0.0 G.M.T. = J.D. 241 5020.0.

It is necessary to know three quantities that change slowly—the arcs NO and $N'O$ and the angle NON' . In the triangle $N\gamma N'$, $\gamma N = \Omega$, $N\gamma N' = \epsilon$ and $\gamma N' = 90^\circ + \alpha_0$, all of which are known, so that the triangle can be completely solved. Then

$$ONN' = 180^\circ - \gamma NN' + i \quad NN'O = 90^\circ - NN'\gamma + \delta_0$$

and NN' is now known, so that the three quantities may be found.

It has been assumed that the Earth's mean equator has been used, whereas actually the point N' should be the intersection of the Earth's true equator and the equator of Mars. The only quantity affected by nutation is $N'O$, which is equal to $N'N'' + N''O$, the part $N''O$ not being affected. Differentiating the triangle $N''\gamma N'$

$$\Delta N'N'' = \cos(90^\circ + \alpha_0) \sin \epsilon \sec \delta_0 \Delta \psi + \sin(90^\circ + \alpha_0) \sec \delta_0 \Delta \epsilon$$

where

$\Delta\psi$ = nutation in longitude

$\Delta\epsilon$ = nutation in obliquity = $-B$

The effect of nutation on $N'N''$ may amount to $\pm 0^\circ.004$, and the annual change of this effect cannot exceed $0^\circ.001$. If we put

$$X = 90^\circ - N'O$$

then, if $\Delta\psi$ and B are in seconds of arc,

$$X = 90^\circ - N'O \text{ for mean equator} - 0^\circ.00013 \Delta\psi + 0^\circ.00036 B$$

and may be tabulated for the beginning of each year.

In the triangle formed by Mars and the poles of the Earth and Mars, the sides and angles will be as shown on the diagram. Now

$$\begin{aligned} A_\oplus + 180^\circ &= N'G - N'O + 180^\circ \\ &= 180^\circ - (90^\circ - N'G) + (90^\circ - N'O) \\ &= R + X \end{aligned}$$

where $R = 180^\circ - (90^\circ - N'G)$. To solve the triangle

$$\begin{aligned} \cos D_\oplus \sin R &= \cos \delta \sin(\alpha - \alpha_0) \\ \cos D_\oplus \cos R &= -\sin \delta \cos \delta_0 + \cos \delta \sin \delta_0 \cos(\alpha - \alpha_0) \\ \sin D_\oplus &= -\sin \delta \sin \delta_0 - \cos \delta \cos \delta_0 \cos(\alpha - \alpha_0) \\ \cos D_\oplus \sin P &= -\cos \delta_0 \sin(\alpha - \alpha_0) \\ \cos D_\oplus \cos P &= \cos \delta \sin \delta_0 - \sin \delta \cos \delta_0 \cos(\alpha - \alpha_0) \end{aligned}$$

In these equations α and δ are the apparent right ascension and declination of the planet, so that no further correction for aberration is necessary. But α_0 and δ_0 also should strictly be referred to the true equator and equinox. They may first be reduced to the equinox of the beginning of the year by applying the precessions given, which include the effect of a small precession of the Martian vernal equinox. The further reductions to the equinox of date would then be

$$\begin{aligned} \Delta\alpha_0 &= Aa + Bb + (18.565 - a)\tau \\ \Delta\delta_0 &= Aa' + Bb' + (12.60 - a')\tau \end{aligned}$$

These amount to

$$\begin{aligned} \Delta\alpha_0 &= 1.81 A + 0.070 B - 0.24 \tau && \text{in seconds of time} \\ \Delta\delta_0 &= 0.0041 A + 0.0002 B - 0.0006 \tau && \text{in degrees.} \end{aligned}$$

Denoting by M' the position of Mars as seen from the Sun, and by $M'E$ the perpendicular from Mars to the ecliptic,

$$\begin{aligned} \odot_s &= OM' = NM' - NO \\ NE &= rE - rN = l - \Omega \\ \tan NM' &= \tan(l - \Omega) \sec i \end{aligned}$$

or, since i is very small,

$$NM' = l - \Omega + 0^\circ.015 \sin 2(l - \Omega)$$

A correction for aberration must be applied to NM' . This will be strictly equal to the daily motion of Mars in heliocentric longitude multiplied by the time in days taken by light to travel from the Sun to Mars, and then back to the Earth. Since the eccentricity e is small, being only 0.093,

$$dv = dM (1 + 2e \cos M) \quad r = a(1 - e \cos M)$$

so that

$$r dv = a dM (1 + e \cos M)$$

Hence the portion of the aberration relating to the distance from Mars to the Sun fluctuates only 9 per cent on either side of its mean, which is $0^\circ.005$. The

EXPLANATION, 1935

average distance of Mars from the Earth during the period covered by the physical ephemeris may be taken as 0.7 units, giving a further correction of 0°.002. If we put

$$Y = NO + 0°.007$$

then

$$\odot_s = l - \Omega + 0°.015 \sin 2(l - \Omega) - Y$$

If M'F is the perpendicular to the equator of Mars

$$OF = A_\odot$$

$$M'F = D_\odot$$

so that

$$\tan A_\odot = \tan \odot_s \cos Z$$

$$\sin D_\odot = \sin \odot_s \sin Z$$

where Z is the angle $NON' = FOM'$ = the obliquity of the Martian ecliptic.

The values of the slowly changing quantities for the years 1930 to 1950 are shown in the table below; i is 1°.850 during this period.

Year	a_0	δ_0	Ω	X	Y	$\sin Z$	$\cos Z$
1930.0	21 10 39.1	54.588	49.018	44.085	38.951	0.40640	0.91370
1931.0	40.7	.591	.025	.079	.955	.40640	.91369
1932.0	42.3	.594	.033	.073	.958	.40641	.91369
1933.0	43.8	.598	.041	.067	.962	.40641	.91369
1934.0	45.4	.602	.049	.062	.966	.40642	.91369
1935.0	21 10 47.0	54.605	49.056	44.057	38.970	0.40642	0.91369
1936.0	48.5	.608	.064	.052	.974	.40643	.91368
1937.0	50.1	.612	.072	.048	.978	.40643	.91368
1938.0	51.6	.616	.079	.044	.982	.40644	.91368
1939.0	53.2	.619	.087	.040	.986	.40644	.91368
1940.0	21 10 54.8	54.622	49.095	44.036	38.990	0.40645	0.91368
1941.0	56.3	.626	.103	.032	.994	.40645	.91367
1942.0	57.9	.629	.110	.027	38.998	.40646	.91367
1943.0	10 59.5	.633	.118	.022	39.002	.40646	.91367
1944.0	11 01.0	.636	.126	.017	.006	.40646	.91367
1945.0	21 11 02.6	54.640	49.133	44.011	39.010	0.40647	0.91366
1946.0	04.2	.643	.141	44.005	.015	.40647	.91366
1947.0	05.7	.647	.149	43.998	.019	.40648	.91366
1948.0	07.3	.650	.157	.991	.023	.40648	.91366
1949.0	08.9	.654	.164	.985	.027	.40649	.91366
1950.0	21 11 10.4	54.657	49.172	43.978	39.031	0.40649	0.91365

For the quantities on the right-hand pages

$$\sin D \sin Q = \cos \delta_0 \sin(\alpha - \alpha_0)$$

$$\sin D \cos Q = -\cos \delta \sin \delta_0 + \sin \delta \cos \delta_0 \cos(\alpha - \alpha_0)$$

in which $\sin D$ is always positive, as D is the elongation of the planet from the Sun.

$$\sin i = \frac{R \sin D}{r} = \frac{R \cos \delta_0 \sin(\alpha - \alpha_0) \operatorname{cosec} Q}{r}$$

$$h = \frac{1}{2}(1 + \cos i) = 1 - \text{haversine } i$$

$$\text{Diameter} = \frac{9.36}{\Delta}$$

$$q = \text{diameter} \times (1 - h)$$

If

V = Martian hour angle of the vernal equinox for a point on the zero meridian
= sidereal time for the "Greenwich" of Mars

then

$V - A_{\odot}$ = Martian hour angle of the Earth for a point on the zero meridian
= longitude of the central meridian as seen from the Earth.

To allow for aberration V must be diminished by the amount of the angular rotation in the planet's light-time, i.e. by $2^{\circ} \cdot 025 \Delta$, so that

Longitude of C.M. = $V + 180^{\circ} - (A_{\odot} + 180^{\circ}) - \text{angular rotation in light-time.}$

To obtain the value of $V + 180^{\circ}$

Longitude of C.M. 1909 January 15.0	344.41 ^o
$A_{\odot} + 180^{\circ}$ (from N.A. for 1909)	337.38
Rotation in light-time	4.055
Sum = $V + 180^{\circ}$ on 1909 January 15.0	325.845

Hence

$$V + 180^{\circ} = 325^{\circ} \cdot 845 + 350^{\circ} \cdot 89202 (\text{J.D.} - 241\ 8322 \cdot 0)$$

The G.M.T. of transit of the zero meridian is found by determining from the longitudes of the central meridian at 0^h the time at which the longitude of the central meridian is 0^o.

Satellites of Mars (Pages 586-589)

The data given are derived from the elements given by H. Struve in *Sitzungsberichte der Königl. Preussischen Akademie der Wissenschaften*, 1911, page 1073.

The elements are defined as follows:—

N = ascending node on the Earth's mean equator

J = inclination to the Earth's mean equator

n = tropical mean daily motion

t_0 = number of days elapsed since the epoch

τ = time expressed in Besselian years

l = mean longitude, measured in the Earth's mean equator from the equinox to the ascending node of the orbit, and then in the orbit itself

Π = longitude of pericentre, measured in the same way as l

e = eccentricity

$a(\Delta)$ = semi-major axis of orbit at unit distance.

The symbols N and J are used without suffix for the satellite and with suffix 1 to define an auxiliary fixed plane, used for defining the plane of the orbit.

Elements of Phobos.

$$\left. \begin{aligned} N_1 &= 47^\circ 03'.7 \\ J_1 &= 37^\circ 24'.0 \end{aligned} \right\} \text{Equator and equinox of 1880.0}$$

$$\left. \begin{aligned} (N - N_1) \sin J_1 &= 57'.5 \sin \{359^\circ.2 - 158^\circ.0(\tau - 1894.80)\} \\ J - J_1 &= 57'.5 \cos \{359^\circ.2 - 158^\circ.0(\tau - 1894.80)\} \end{aligned} \right\} \text{Equator and equinox of 1880.0; epoch } \tau$$

$$l_0 = 296^\circ.40 \quad \text{Epoch 1894 October 0.0 G.M.T.} = \text{J.D. 241 3102.0}$$

$$n = 1128^\circ.84406$$

$$l = l_0 + n\tau + 0^\circ.32 \sin \{359^\circ.2 - 158^\circ.0(\tau - 1894.80)\}$$

$$\Pi = 279^\circ.1 + 158^\circ.0(\tau - 1894.80)$$

$$e = 0.0170$$

$$a(\Delta) = 12''.938$$

Elements of Deimos.

$$\left. \begin{aligned} N_1 &= 46^\circ 01'.2 \\ J_1 &= 36^\circ 44'.0 \end{aligned} \right\} \text{Equator and equinox of 1880.0}$$

$$\left. \begin{aligned} (N - N_1) \sin J_1 &= 1^\circ 44'.0 \sin \{27^\circ.3 - 6^\circ.374(\tau - 1894.80)\} \\ J - J_1 &= 1^\circ 44'.0 \cos \{27^\circ.3 - 6^\circ.374(\tau - 1894.80)\} \end{aligned} \right\} \begin{array}{l} \text{Equator and equi-} \\ \text{nox of 1880.0;} \\ \text{epoch } \tau \end{array}$$

$$l_0 = 186^\circ.17 \quad \text{Epoch 1894 October 0.0 G.M.T.} = \text{J.D. 241 3102.0}$$

$$n = 285^\circ.16196$$

$$l = l_0 + n\tau + 0^\circ.58 \sin \{27^\circ.3 - 6^\circ.374(\tau - 1894.80)\}$$

$$\Pi = 231^\circ + 6^\circ.374(\tau - 1894.80)$$

$$e = 0.0031$$

$$a(\Delta) = 32''.373$$

The elements of the equator of Mars, as given by Struve, are

$$N_0 = 47^\circ 04'.4 + 0'.463(\tau - 1880.0) \quad \text{Mean equator and}$$

$$J_0 = 37^\circ 24'.4 - 0'.239(\tau - 1880.0) \quad \text{equinox of } \tau$$

The node N'_0 and the inclination J'_0 referred to the orbit of Mars at the epoch 1880.0 are

$$N'_0 = 81^\circ 00'.3$$

$$J'_0 = 25^\circ 10'.2$$

where N'_0 is measured from the ascending node of the orbit of Mars on the Earth's mean equator. The quantity J'_0 is the obliquity of the Martian equator. The annual precession of the Martian equinoxes is $-7''.07$.

The quantities on pages 587 and 589, in conjunction with the times of greatest eastern elongation on pages 586 and 588, enable an approximate position angle p and distance s of the satellite from the centre of the primary to be determined. The apparent orbit of the satellite is an ellipse whose semi-major axis is of length $\frac{a(\Delta)}{\Delta}$

and in position angle P . P_0 is the value of P at some arbitrary date near opposition, and is the quantity appearing in the column p^1 for the time 0^h 00^m from eastern elongation. The angle through which the satellite has moved since eastern elongation, increased by P_0 , is the quantity p^1 . F is the ratio of the actual distance of the satellite from the primary to the distance at elongation. a is the semi-major axis in seconds of arc at the mean distance (Δ) of Mars, so that $a(\Delta)$ is the semi-major axis at unit distance. Δ is the distance of Mars from the Earth.

As the eccentricity of the apparent orbit of the satellite is continually varying it is evident that the quantities p^1 and F are also changing. The values given are

accurate in the neighbourhood of opposition. The positions of the satellites deduced from the data given are intended to serve for identification purposes only, and not for the comparison of observations with theory.

Ephemeris for Physical Observations of Jupiter (Pages 590-595)

The definitions of the quantities tabulated are similar to those already given for Mars. The zenocentric longitude of the Sun is not tabulated. It may be noted that Q is also the position angle of the shadows of the satellites measured from the satellites themselves.

The assumed position of the north pole of Jupiter at the beginning of year t is

$$\begin{aligned} \alpha_0 &= 17^h 52^m 00^s.84 + 0^s.247(t - 1910.0) \\ \delta_0 &= 64^\circ 33' 34''.6 - 0''.60(t - 1910.0) \end{aligned}$$

which has been deduced from the position given by Damoiseau for 1750 in *Tables Écliptiques des Satellites de Jupiter*.

The position of the zero meridian is defined by the following adopted values of the longitude of the central meridian on 1897 July 14.0 G.M.T.

System I	47°·31	System II	96°·58
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these being the last values published by Marth (*M.N.R.A.S.*, 56, 523) before his death. The adopted daily motions of the zero meridians (relative to the vernal equinox of Jupiter) and the resulting periods are

System I	877°·90	9 ^h 50 ^m 30 ^s ·003
System II	870°·27	9 ^h 55 ^m 40 ^s ·632

The tables of the *Movement of the Central Meridian* are based on the mean daily synodic rotation during the period when the planet is observable, namely 877°·95 for System I and 870°·30 for System II.

The equatorial diameter at unit distance is taken as 196"·94, and the polar diameter as $\frac{1}{4}$ of this, or 183"·81. The excess of the equatorial diameter over the polar is calculated as follows:—

D_\oplus	F	$\cos \epsilon_0 = \frac{1}{4}$
0·00	0·0667	$\sin \epsilon = \sin \epsilon_0 \cos D_\oplus$
0·89	0·0666	Excess = diameter $\times (1 - \cos \epsilon)$
2·35	0·0665	= diameter $\times F$
3·21	0·0664	
3·40		

where F is tabulated in the accompanying critical table with argument D_\oplus .

The magnitude is computed from Müller's formula

$$-8.93 + 5 \log r \Delta$$

The *Correction for Phase*, which is numerically equal to $57^\circ.3 (1 - k)$ or $57^\circ.3 \sin^2 \frac{1}{2} i$, is the correction that must be applied to the longitude of the central meridian to give the longitude of the meridian that bisects the apparent or illuminated disc. In the columns on page 591 this correction has not been applied, but on pages 592 and 594 it has already been applied.

The zenographical latitude D'_\oplus of the apparent centre of the disc is given by

$$\tan D'_\oplus = \sec^2 \epsilon_0 \tan D_\oplus = 1.148 \tan D_\oplus$$

or, since D_\oplus cannot exceed $\pm 3^\circ.4$

$$D'_\oplus = 1.148 D_\oplus$$

Similarly the eccentric angle D'_\oplus at the centre of Jupiter of the apparent centre of the disc is given by

$$D'_\oplus = \sec \epsilon_0 D_\oplus = 1.071 D_\oplus$$

If the angular distance from the centre of the disc of a spot on the central meridian be denoted by d (positive to the north) and the polar semi-diameter by b , the zenocentric latitude β or the zenographical latitude β' of the spot may be determined from

$$\sin \theta = \frac{d}{b}$$

$$\beta' = \theta + D'_\oplus$$

$$\tan \beta = \cos \epsilon_0 \tan \beta' = 0.9333 \tan \beta'$$

$$\tan \beta'' = \sec \epsilon_0 \tan \beta' = 1.0714 \tan \beta'$$

Satellites of Jupiter (Pages 596-621)

The data concerning the four brighter satellites are derived from Sampson's *Tables of the Four Great Satellites of Jupiter* (London, 1910). Certain simplifications of the tables, as described by H. Andoyer in *Bulletin Astronomique*, 32, 177 (1915) have been adopted for ephemeris purposes, so that the data given are not intended for the rigorous comparison of observation with theory.

The elongations of satellite V are derived from elements deduced by J. Robertson in 1895, and published in the *Connaissance des Temps* each year. The differential co-ordinates of satellites VI and VII are derived from elements and tables given by F. E. Ross in *Lick Observatory Bulletin*, Vol. IV, No. 112 (1906) and in *Astronomische Nachrichten* 4175 (1907).

Extensive tables to facilitate the computation of accurate positions relative to Jupiter of the four brighter satellites are given each year in the *Connaissance des Temps*.

All the times given have been corrected for light-time, and, where necessary, for the phase of the planet. In the diagram on page 596 the central ellipse represents the disc of Jupiter, and the inner orbit is that of satellite V.

Before opposition eclipses may be observed on the west side of Jupiter, after opposition on the east. Before opposition the immersions of satellite I in the shadow may be observed, while after that date the emersions only are visible. The same is true in general of satellite II, although occasionally both phenomena may be seen. In the case of satellites III and IV both phases are usually visible, except near opposition. The points of immersion into and emersion from the shadow are shown pictorially at the foot of the right-hand page for each month, while at the foot of the left-hand page the rectangular co-ordinates are given, in units of the equatorial radius of Jupiter, the axis of x being parallel to the equator of Jupiter and directed positively to the east, while the axis of y is directed positively to the north pole of Jupiter. The suffix 1 refers to an immersion or beginning of the eclipse, and the suffix 2 to an emersion or end of the eclipse.

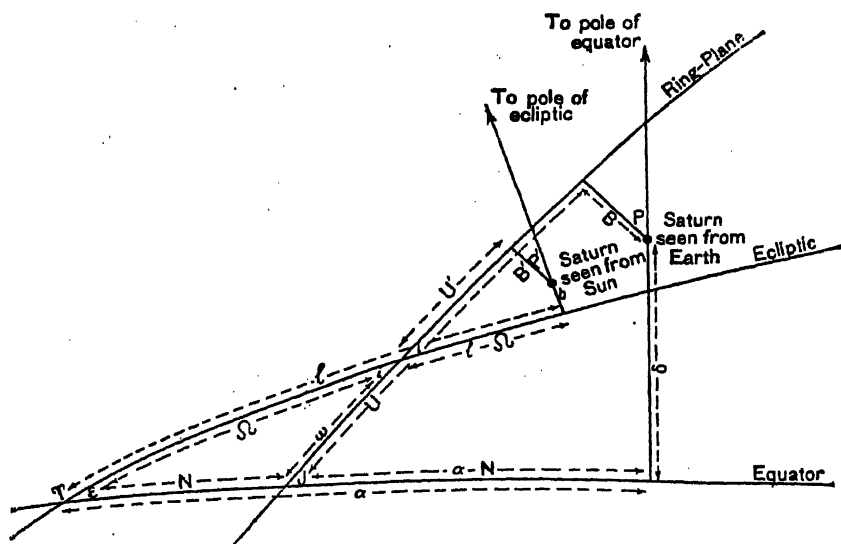
In the diagrams of the configurations of the four brighter satellites Jupiter is represented by a light disc in the centre of the page, and the relative positions of the satellites at the times stated above the diagrams are indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot, the motion of the satellite at the instant in question being always towards the numeral. In constructing the diagrams the latitudes of the satellites are considered to be zero, except when two or more of them happen to be at nearly the same distance from the planet, in which case they are placed one above the other, as they would appear in the sky, although no attempt has been made to represent the distance between them to scale. A light disc, accompanied by a numeral, placed at the side of the diagram indicates that the satellite is projected on to the disc of Jupiter; in other words a transit is in progress. A dark disc indicates that the satellite is invisible, either because it is occulted by Jupiter, or because it is immersed in the shadow. The disc is placed on the right or left according as the satellite is on the right or left of the centre of Jupiter at the moment for which the configuration is given.

Rings of Saturn (Pages 622-624)

The elements tabulated are defined as follows:—

- a, b = axes of the outer ellipse of the outer ring
- P = position angle of the northern semi-minor axis of the rings, measured from the north and positive towards the east
- B = saturnicentric latitude of the Earth referred to the ring-plane and positive towards the north
- U = geocentric longitude of Saturn, measured in the ring-plane from its ascending node on the Earth's mean equator. $U + 180^\circ$ is the saturnicentric longitude of the Earth measured in the ring-plane from its ascending node on the Earth's mean equator.
- P' = the angle that the northern semi-minor axis of the rings makes with the latitude circle through the centre of Saturn, as seen from the Sun and positive towards the east
- B' = saturnicentric latitude of the Sun referred to the ring-plane and positive towards the north
- U' = heliocentric longitude of Saturn, measured in the ring-plane from its ascending node on the ecliptic
- Ω = ascending node of the ring-plane on the ecliptic, measured from the mean equinox
- i = inclination of the ring-plane to the ecliptic
- N = ascending node of the ring-plane on the Earth's mean equator, measured from the mean equinox
- J = inclination of the ring-plane to the Earth's mean equator
- ω = the angular distance in the ring-plane from its ascending node on the Earth's mean equator to its ascending node on the ecliptic.

The geometrical significance of the above quantities may be studied in the accompanying diagram. They are all tabulated for the moment when light left Saturn; to compare observed quantities with those tabulated the light time should be subtracted from the time of observation.



The outer diameter of the rings at distance 9.53887 units is, according to H. Struve (*Beobachtungen der Saturnstrabanten*, *Publications de l'Observatoire Central Nicolas*, vol. xi, page 226), $39''.35$, corresponding to a diameter of $375''.35$ at unit distance. The minor axis b of the rings is $a \sin B$. The factors by which a and b must be multiplied to give the other dimensions of the rings are given below. The factor for the dusky ring is based on the observations of various astronomers, and the remainder on Bessel's data.

The inner ellipse of the outer ring	0.8801
The outer ellipse of the inner ring	0.8599
The inner ellipse of the inner ring	0.6650
The inner ellipse of the dusky ring	0.5486

The adopted position of the ring-plane, referred to the mean ecliptic and equinox of 1889.25, is, according to H. Struve (*loc. cit.*, page 166),

$$\Omega = 167^\circ 57'.0 \quad i = 28^\circ 05'.6$$

To compute N , J and ω

$$\begin{aligned} \sin J \sin N &= \sin i \sin \Omega \\ \sin J \cos N &= \cos i \sin \epsilon + \sin i \cos \epsilon \cos \Omega \\ \cos J &= \cos i \cos \epsilon - \sin i \sin \epsilon \cos \Omega \\ \sin J \sin \omega &= \sin \epsilon \sin \Omega \\ \sin J \cos \omega &= \sin i \cos \epsilon + \cos i \sin \epsilon \cos \Omega \end{aligned}$$

The quantities Ω and i must be corrected for precession and shift of the ecliptic. They vary slowly, as do N , J and ω , so may be expressed by a time power series, in which T is reckoned in tropical centuries from 1900.0.

$$\Omega = 168.09980 + 1.39351 T + 0.00041 T^2$$

$$i = 28.09193 - 0.01302 T$$

$$N = 126.40593 + 3.99960 T + 0.21732 T^2 + 0.01011 T^3 + 0.00015 T^4$$

$$J = 6.92944 - 0.44818 T + 0.01163 T^2 + 0.00078 T^3 + 0.00004 T^4$$

$$\omega = 42.86155 - 2.74230 T - 0.21709 T^2 - 0.01010 T^3 - 0.00015 T^4$$

The values for the years 1920-1950 are given in the accompanying table.

RINGS OF SATURN

Date	Ω	i	N	J	ω
1920.0	168.3785	28.0893	127.2146	6.8403	42.3043
1921.0	.3925	.0892	.2555	.8358	.2760
1922.0	.4064	.0891	.2965	.8314	.2476
1923.0	.4203	.0889	.3375	.8270	.2192
1924.0	.4343	.0888	.3785	.8226	.1908
1925.0	168.4482	28.0887	127.4196	6.8181	42.1623
1926.0	.4621	.0885	.4607	.8137	.1337
1927.0	.4761	.0884	.5019	.8093	.1051
1928.0	.4900	.0883	.5431	.8049	.0765
1929.0	.5040	.0882	.5843	.8005	.0478
1930.0	168.5179	28.0880	127.6256	6.7961	42.0191
1931.0	.5318	.0879	.6670	.7916	.41.9903
1932.0	.5458	.0878	.7084	.7872	.9615
1933.0	.5597	.0876	.7498	.7828	.9326
1934.0	.5736	.0875	.7913	.7784	.9037
1935.0	168.5876	28.0874	127.8328	6.7740	41.8747
1936.0	.6015	.0872	.8744	.7696	.8457
1937.0	.6155	.0871	.9160	.7652	.8167
1938.0	.6294	.0870	.9577	.7609	.7876
1939.0	.6433	.0869	127.9994	.7565	.7584
1940.0	168.6573	28.0867	128.0412	6.7521	41.7292
1941.0	.6712	.0866	.0830	.7477	.7000
1942.0	.6851	.0865	.1248	.7433	.6707
1943.0	.6991	.0863	.1667	.7389	.6414
1944.0	.7130	.0862	.2087	.7346	.6120
1945.0	168.7270	28.0861	128.2507	6.7302	41.5826
1946.0	.7409	.0859	.2927	.7258	.5532
1947.0	.7548	.0858	.3348	.7214	.5237
1948.0	.7688	.0857	.3769	.7171	.4941
1949.0	.7827	.0856	.4191	.7127	.4645
1950.0	168.7967	28.0854	128.4613	6.7084	41.4349

In forming U , B and P the effect of nutation and planetary aberration is first removed from the apparent right ascension and declination of Saturn by subtracting from the right ascension

$(A - \tau) (m + n \sin \alpha \tan \delta) + \frac{1}{15} B \cos \alpha \tan \delta - 0.00577 \Delta \times \text{variation per day}$
and from the declination

$(A - \tau) n \cos \alpha - B \sin \alpha - 0.00577 \Delta \times \text{variation per day}$

We have then

$$\begin{aligned}
 \cos B \sin P &= -\sin J \cos(\alpha - N) \\
 \cos B \cos P &= \cos J \cos \delta + \sin J \sin \delta \sin(\alpha - N) \\
 \sin B &= -\cos J \sin \delta + \sin J \cos \delta \sin(\alpha - N) \\
 \cos B \sin U &= \sin J \sin \delta + \cos J \cos \delta \sin(\alpha - N) \\
 \cos B \cos U &= \cos \delta \cos(\alpha - N)
 \end{aligned}$$

Similarly, if l and b represent the heliocentric longitude and latitude of Saturn, referred to the mean equinox

$$\begin{aligned}\cos B' \sin P' &= -\sin i \cos(l - \Omega_0) \\ \cos B' \cos P' &= \cos i \cos b + \sin i \sin b \sin(l - \Omega_0) \\ \sin B' &= -\cos i \sin b + \sin i \cos b \sin(l - \Omega_0) \\ \cos B' \sin U' &= \sin i \sin b + \cos i \cos b \sin(l - \Omega_0) \\ \cos B' \cos U' &= \cos b \cos(l - \Omega_0)\end{aligned}$$

Müller's formula for the magnitude may be written

$$-8.68 + 5 \log r\Delta \pm 0.044(U' + \omega - U) - 2.60 \sin B + 1.25 \sin^2 B$$

where $(U' + \omega - U)$ is measured in degrees and the sign of the third term is chosen to make this term positive.

Satellites of Saturn (Pages 625-635)

The data concerning the satellites of Saturn (except Rhea and Phoebe) are derived from the elements of H. Struve as given in *Observations de Poulkova*, Supplément I (St. Petersburg, 1888), in *Publications de l'Observatoire Central Nicolas*, Série II, Vol. XI (St. Petersburg, 1898), and in *Astronomische Nachrichten* 3885-86 (1903). The orbit of Rhea is given by G. Struve in *Veröffentlichungen der Universitäts-Sternwarte zu Berlin-Babelsberg*, Band VI, Heft 1, page 16. The differential co-ordinates of Phoebe are derived from elements and tables given by F. E. Ross in *Annals of the Harvard College Observatory*, Vol. 53, No. 6 (1905).

The times of elongation and conjunction have been corrected for light-time. The differential co-ordinates of Hyperion and Iapetus have not been thus corrected, so that light-time must be subtracted from the time of an observation before comparing with the ephemeris.

The symbols used on pages 632-635 have already been explained under *Satellites of Mars*.

Revised elements of the five inner satellites have been given by G. Struve in *Veröffentlichungen der Universitäts-Sternwarte zu Berlin-Babelsberg*, Band VI, Heft 4 (1930), and of Titan and Iapetus in Heft 5 (1933). These elements, together with those of H. Struve for Hyperion and of Ross for Phoebe, are given below. The notation used is:—

- E_0 = mean longitude at the epoch
- n = tropical mean daily motion
- t_s = number of days elapsed since the epoch
- t = number of tropical years elapsed since the epoch
- $= t_s \div 365.2422$
- τ = date expressed in Besselian years
- δl = libration in longitude
- l_1, l = mean longitude in the orbit
- Θ_1 = mean longitude of the ascending node on the ring-plane
- Ω = mean longitude of the ascending node on the ecliptic
- i = inclination to the ecliptic
- γ = inclination to the ring-plane
- Π_1, Π = mean longitude of perisaturnium
- e = eccentricity
- a = semi-major axis at the mean distance of Saturn
- $A = a(\Delta)$ = semi-major axis at unit distance
- Δ = geocentric distance of Saturn
- (Δ) = mean distance of Saturn = 9.53887.

l_1 , Π_1 and Θ_1 are measured from the equinox in the ecliptic to the ascending node of the ring-plane on the ecliptic, then in the ring-plane, and then (except Θ_1) in the orbit itself. l and Π are measured from the equinox in the ecliptic to the ascending node of the orbit on the ecliptic, and then in the orbit itself. The ring-plane is assumed to be in the plane of Saturn's equator, and its node and inclination, as given on pages 832-833, are here denoted by Ω_1 and i_1 .

For the five inner satellites

Epoch for $E_0 = 1889$ April 0.0 G.M.T. = J.D. 241 1093.0

Epoch from which t is measured = 1889.25

Mimas

$$\begin{aligned} E_0 &= 127^\circ 05'.5 \\ n &= 381^\circ.99444 \ 2 \\ \delta l &= -44^\circ.390 \sin 5^\circ.0864(\tau - 1866.27) \\ &\quad - 0^\circ.764 \sin 3\{5^\circ.0864(\tau - 1866.27)\} \\ l_1 &= E_0 + nt_a + \delta l \\ \Theta_1 &= 56^\circ.1 - 365^\circ.23 \ t \\ \gamma &= 1^\circ 31'.0 \\ \Pi_1 &= 105^\circ.0 + 365^\circ.60 \ t \\ e &= 0.0201 \\ a &= 26''.826 \end{aligned}$$

Enceladus

$$\begin{aligned} E_0 &= 199^\circ 25'.8 \\ n &= 262^\circ.73194 \ 05 \\ \delta l &= +14'.39 \sin(63^\circ.75 + 32^\circ.51 \ t) \\ &\quad + 14'.06 \sin(117^\circ.28 + 93^\circ.14 \ t) \\ l_1 &= E_0 + nt_a + \delta l \\ \Theta_1 &= 52^\circ - 152^\circ.7 \ t \\ \gamma &= 1'.4 \\ \Pi_1 &= 308^\circ.38 + 123^\circ.43 \ t \\ e &= 0.00444 \\ a &= 34''.416 \end{aligned}$$

Tethys

$$\begin{aligned} E_0 &= 284^\circ 28'.3 \\ n &= 190^\circ.69795 \ 0 \\ \delta l &= +2^\circ.065 \sin 5^\circ.0864(\tau - 1866.27) \\ &\quad + 0^\circ.036 \sin 3\{5^\circ.0864(\tau - 1866.27)\} \\ l_1 &= E_0 + nt_a + \delta l \\ \Theta_1 &= 110^\circ.39 - 72^\circ.25 \ t \\ \gamma &= 1^\circ 05'.56 \\ a &= 42''.605 \end{aligned}$$

Dione

$$\begin{aligned} E_0 &= 253^\circ 52'.0 \\ n &= 131^\circ.53497 \ 29 \\ \delta l &= -0'.93 \sin(63^\circ.75 + 32^\circ.51 \ t) \\ &\quad - 0'.91 \sin(117^\circ.28 + 93^\circ.14 \ t) \\ l_1 &= E_0 + nt_a + \delta l \\ \Theta_1 &= 201^\circ - 31^\circ.0 \ t \quad \gamma = 1'.4 \\ \Pi_1 &= 173^\circ.4 + 30^\circ.75 \ t \\ e &= 0.00221 \quad a = 54''.567 \end{aligned}$$

Rhea

$$\begin{aligned} E_0 &= 358^\circ 23'.7 \\ n &= 79^\circ.69008 \ 81 \\ l_1 &= E_0 + nt_a \\ (\Omega - \Omega_1) \sin i_1 &= 20'.49 \sin(344^\circ.09 - 10^\circ.20 \ t) - 0'.38 + 1'.00 \sin(48^\circ.5 - 0^\circ.50 \ t) \\ i - i_1 &= 20'.49 \cos(344^\circ.09 - 10^\circ.20 \ t) - 2'.79 + 1'.00 \cos(48^\circ.5 - 0^\circ.50 \ t) \\ e &= 0.00098 + 0.00030 \cos 9^\circ.5(\tau - 1879.59) \\ \Pi_1 &= \Pi' + 17^\circ.64 \sin 9^\circ.5(\tau - 1879.59) \\ \Pi' &= 276^\circ.25 + 0^\circ.53 \ t \\ a &= 76''.203 \end{aligned}$$

*Titan*Epoch for $E_0 = 1890$ January 0.0 G.M.T. = J.D. 241 1368.0Epoch from which t is measured = 1890.0

$$\begin{aligned}
 E_0 &= 260^\circ 24'.26 \\
 n &= 22^\circ.57701 \ 508 \\
 E - E_0 &= +4'.39 \sin(40^\circ.69 - 0^\circ.506 \ t) \\
 l &= E_0 + nt_s + (E - E_0) \\
 \Omega &= 167^\circ 51'.90 + 39'.00 \sin(40^\circ.69 - 0^\circ.506 \ t) \\
 i &= 27^\circ 26'.33 + 18'.35 \cos(40^\circ.69 - 0^\circ.506 \ t) \\
 \Pi &= 276^\circ 07'.7 + 31'.41 \ t + 22'.0 (\sin 2g - \sin 2g_0) \\
 e &= 0.02910 + 0.000186 (\cos 2g_0 - \cos 2g) \\
 g &= \Pi - \Omega - 4^\circ.5 \\
 g_0 &= g \text{ for } t = 0 \\
 a &= 176''.578
 \end{aligned}$$

Hyperion

Epoch = 1890 January 0.0 G.M.T. = J.D. 241 1368.0

$$\begin{aligned}
 E_0 &= 304^\circ.53 \\
 n &= 16^\circ.91998 \ 3 \\
 \delta l &= 9^\circ.16 \sin(200^\circ.5 + 0^\circ.56206 \ t_s) \\
 l &= E_0 + nt_s + \delta l \\
 \text{Equinox} &= 1890.0 \quad \text{Epoch} = 1890.0 + t \\
 \Omega &= 167^\circ 49'.7 + 42'.4 \sin(47^\circ.8 - 0^\circ.50 \ t) + 78'.1 \sin(121^\circ.7 - 2^\circ.0 \ t) \\
 i &= 27^\circ 20'.8 + 19'.6 \cos(47^\circ.8 - 0^\circ.50 \ t) + 36'.2 \cos(121^\circ.7 - 2^\circ.0 \ t) \\
 \text{Epoch and equinox} &= 1888.89 + t \\
 \Pi &= 276^\circ.50 - 18^\circ.663 \ t + 14^\circ.0 \sin(359^\circ.16 + 19^\circ.191 \ t) \\
 &\quad - 1^\circ.5 \sin(358^\circ.32 + 38^\circ.382 \ t) \\
 e &= 0.1043 + 0.0230 \cos(359^\circ.16 + 19^\circ.191 \ t) + \delta e
 \end{aligned}$$

Epoch = 1890 January 0.0 G.M.T. = J.D. 241 1368.0

$$\begin{aligned}
 e \delta e &= -0.00044 \cos(200^\circ.5 + 0^\circ.56206 \ t_s) \\
 a &= 213''.92 + \delta a \\
 \delta a &= -0.00354 \ a \cos(200^\circ.5 + 0^\circ.56206 \ t_s)
 \end{aligned}$$

Another discussion of the orbit of Hyperion, with elements, is given by J. Woltjer in "The Motion of Hyperion", in *Annalen van de Sterrewacht te Leiden*, Vol. XVI, Part III (1928).

Iapetus

Epoch = 1885 September 1.0 G.M.T. = J.D. 240 9786.0

$$\begin{aligned}
 E_0 &= 75^\circ 25'.61 & i &= 18^\circ 26'.39 - 0'.54 \ t \\
 n &= 4^\circ.53799 \ 536 & \Pi &= 354^\circ 27'.4 + 8'.1 \ t \\
 l &= E_0 + nt_s & e &= 0.02828 \\
 \Omega &= 142^\circ 11'.3 - 1'.375 \ t & a &= 514''.59
 \end{aligned}$$

Phoebe

Epoch = 1900 January 0.0 G.M.T. = J.D. 241 5020.0

$$\begin{aligned}
 l &= 343^\circ.15 - 0^\circ.65398 \ t_s & \Pi &= 291^\circ.03 - 0^\circ.2680 \ t \\
 \Omega &= 224^\circ.51 + 0^\circ.4347 \ t & e &= 0.1659 \\
 i &= 175^\circ.08 - 0^\circ.020 \ t & A &= 17861''
 \end{aligned}$$

For the six inner satellites L , M and θ , based on the elements of G. Struve, are tabulated on pages 840-841 at intervals of 10 days, the dates chosen being those on which the integral part of the Julian Day number is divisible by 10.

L = mean longitude in the orbit, reckoned in the ring-plane from the ascending node of the ring-plane on the Earth's mean equator to the ascending node of the orbit on the ring-plane, and then in the orbit itself

$$= l_1 - \Omega_1 + \omega, \text{ where } \omega \text{ is defined on page 831}$$

$$= l - \Omega_1 + \omega - 2(\Omega - \Omega_1) \sin \frac{1}{2}i \sin \frac{1}{2}i_1$$

M = mean anomaly $= l_1 - \Pi_1 = l - \Pi$

θ = longitude of the ascending node of the orbit on the ring-plane, reckoned from the ascending node of the ring-plane on the Earth's mean equator

$$= \Theta_1 - \Omega_1 + \omega \text{ for Mimas, Enceladus, Tethys and Dione.}$$

For Rhea and Titan ϵ and $\sin \gamma$ are given also. In the case of Rhea θ and γ are found from

$$\tan \eta = \frac{(\Omega - \Omega_1) \sin i_1}{i - i_1}$$

$$\theta = \eta + \omega + (\Omega - \Omega_1) \sin i_1 \cot i_1 (1 - \frac{1}{2} \sin^2 \eta)$$

$$\gamma = (\Omega - \Omega_1) \sin i_1 \operatorname{cosec} \eta$$

$$= (i - i_1) \sec \eta \text{ if } \operatorname{cosec} \eta \text{ is large.}$$

According to G. Struve: "As a consequence of perturbations by Titan, the longitude of the perisaturnium of Rhea is the same as that of Titan, oscillating about it in a period of 38 years. The eccentricity of the orbit of Rhea is a forced one, produced by Titan, and is subject to variations of corresponding period." Hence the term Π' in the elements of G. Struve has been replaced by the actual value of Π for Titan, but with the omission of the periodic solar perturbations.

For Titan the precessions of Ω and i are assumed to be the same as those of Ω_1 and i_1 ; this leads to

$$\Omega - \Omega_1 = -0^\circ.09545 + 0^\circ.65000 \sin(40^\circ.69 - 0^\circ.506 t)$$

$$i = 27^\circ.43883 + 0^\circ.30583 \cos(40^\circ.69 - 0^\circ.506 t) - 0^\circ.00013 t$$

where t is measured from 1890.0. Then

$$L = l - \Omega_1 + \omega - 2(\Omega - \Omega_1) \sin \frac{1}{2}i \sin \frac{1}{2}i_1$$

while θ , η and $\sin \gamma$ are found from

$$\sin \gamma \sin(\theta - \omega) = \sin i \sin(\Omega - \Omega_1)$$

$$\sin \gamma \cos(\theta - \omega) = -\cos i \sin i_1 + \sin i \cos i_1 \cos(\Omega - \Omega_1)$$

$$\cos \gamma = \cos i \cos i_1 + \sin i \sin i_1 \cos(\Omega - \Omega_1)$$

$$\sin \gamma \sin \eta = \sin i_1 \sin(\Omega - \Omega_1)$$

$$\sin \gamma \cos \eta = \sin i \cos i_1 - \cos i \sin i_1 \cos(\Omega - \Omega_1)$$

As a check, since $\Omega - \Omega_1$ and $i - i_1$ are small,

$$\theta - \omega - \eta - (\Omega - \Omega_1) = -2(\Omega - \Omega_1) \sin \frac{1}{2}i \sin \frac{1}{2}i_1$$

Since g is strictly the distance of perisaturnium from the node of the satellite orbit on Saturn's orbit, the expression $g = \Pi - \Omega - 4^\circ.5$ is replaced by

$$g = \Pi - \Omega - \Psi$$

where Ψ is the intercept on the orbit of the satellite from the node on the ecliptic

EXPLANATION, 1935

GEOCENTRIC DISTANCE AND LIGHT-TIME OF SATURN

Date	$\frac{1}{\Delta}$	Light-time	Date	$\frac{1}{\Delta}$	Light-time
July 1	0.10836 ⁺¹⁷	0.05326 ^d	Aug. 16	0.11417 ⁺ 6	0.05055 ^d 3
2	10853 ¹⁷	0.05317 ⁻ 9	17	11423 ⁺ 6	0.05052 ⁻ 3
3	10870 ¹⁷	0.05309 ⁻ 8	18	11429 ⁻ 6	0.05050 ⁻ 2
4	10887 ¹⁷	0.05301 ⁻ 8	19	11434 ⁻ 5	0.05047 ⁻ 3
5	10904 ¹⁷	0.05293 ⁻ 8	20	11438 ⁻ 4	0.05045 ⁻ 2
6	10921 ⁺¹⁶	0.05284 ⁻ 8	21	11442 ⁺ 4	0.05044 ⁻ 2
7	10937 ¹⁷	0.05276 ⁻ 7	22	11446 ⁺ 4	0.05042 ⁻ 2
8	10954 ¹⁶	0.05269 ⁻ 8	23	11450 ⁻ 4	0.05040 ⁻ 1
9	10970 ¹⁶	0.05261 ⁻ 8	24	11453 ⁻ 3	0.05039 ⁻ 1
10	10986 ¹⁶	0.05253 ⁻ 8	25	11455 ⁻ 2	0.05038 ⁻ 1
11	0.11002 ⁺¹⁶	0.05245 ⁻ 7	26	0.11458 ⁺ 2	0.05037 ⁻ 1
12	11018 ¹⁶	0.05238 ⁻ 8	27	11460 ⁻ 1	0.05036 ⁻ 1
13	11034 ¹⁵	0.05230 ⁻ 7	28	11461 ⁻ 1	0.05035 ⁻ 0
14	11049 ¹⁵	0.05223 ⁻ 7	29	11462 ⁺ 1	0.05035 ⁻ 1
15	11064 ¹⁵	0.05216 ⁻ 7	30	11463 ⁺ 0	0.05034 ⁻ 0
16	0.11079 ⁺¹⁵	0.05209 ⁻ 7	31	0.11463 ⁻ 0	0.05034 ⁺ 0
17	11094 ¹⁵	0.05202 ⁻ 7	Sept. 1	11463 ⁻ 0	0.05034 ⁻ 1
18	11109 ¹⁵	0.05195 ⁻ 7	2	11463 ⁻ 1	0.05035 ⁻ 0
19	11124 ¹⁴	0.05188 ⁻ 7	3	11462 ⁻ 2	0.05035 ⁻ 1
20	11138 ¹⁴	0.05181 ⁻ 6	4	11460 ⁻ 1	0.05036 ⁻ 0
21	0.11152 ⁺¹⁴	0.05175 ⁻ 6	5	0.11459 ⁻ 2	0.05036 ⁺ 1
22	11166 ¹³	0.05169 ⁻ 7	6	11457 ⁻ 3	0.05037 ⁻ 1
23	11179 ¹⁴	0.05162 ⁻ 6	7	11454 ⁻ 3	0.05038 ⁻ 2
24	11193 ¹³	0.05156 ⁻ 6	8	11451 ⁻ 3	0.05040 ⁻ 1
25	11206 ¹²	0.05150 ⁻ 6	9	11448 ⁻ 4	0.05041 ⁻ 2
26	0.11218 ⁺¹³	0.05144 ⁻ 6	10	0.11444 ⁻ 4	0.05043 ⁺ 1
27	11231 ¹²	0.05138 ⁻ 5	11	11440 ⁻ 5	0.05044 ⁻ 2
28	11243 ¹²	0.05133 ⁻ 6	12	11436 ⁻ 4	0.05046 ⁻ 2
29	11255 ¹²	0.05127 ⁻ 5	13	11431 ⁻ 5	0.05048 ⁻ 3
30	11267 ¹¹	0.05122 ⁻ 5	14	11426 ⁻ 6	0.05051 ⁻ 2
31	0.11278 ⁺¹¹	0.05117 ⁻ 5	15	0.11420 ⁻ 6	0.05053 ⁺ 3
Aug. 1	11289 ¹¹	0.05112 ⁻ 5	16	11414 ⁻ 6	0.05056 ⁻ 3
2	11300 ¹¹	0.05107 ⁻ 5	17	11408 ⁻ 7	0.05059 ⁻ 3
3	11311 ¹⁰	0.05102 ⁻ 4	18	11401 ⁻ 7	0.05062 ⁻ 3
4	11321 ¹⁰	0.05098 ⁻ 4	19	11394 ⁻ 7	0.05065 ⁻ 3
5	0.11331 ⁺¹⁰	0.05093 ⁻ 4	20	0.11387 ⁻ 8	0.05068 ⁺ 3
6	11341 ⁹	0.05089 ⁻ 4	21	11379 ⁻ 8	0.05071 ⁻ 4
7	11350 ⁹	0.05085 ⁻ 4	22	11371 ⁻ 8	0.05075 ⁻ 4
8	11359 ⁸	0.05081 ⁻ 4	23	11363 ⁻ 9	0.05079 ⁻ 4
9	11367 ⁸	0.05077 ⁻ 4	24	11354 ⁻ 9	0.05083 ⁻ 4
10	0.11375 ⁺⁸	0.05073 ⁻ 3	25	0.11345 ⁻¹⁰	0.05087 ⁺ 4
11	11383 ⁸	0.05070 ⁻ 4	26	11335 ⁻¹⁰	0.05091 ⁻ 5
12	11391 ⁷	0.05066 ⁻ 3	27	11325 ⁻¹⁰	0.05096 ⁻ 4
13	11398 ⁷	0.05063 ⁻ 3	28	11315 ⁻¹⁰	0.05100 ⁻ 5
14	11405 ⁶	0.05060 ⁻ 3	29	11305 ⁻¹¹	0.05105 ⁻ 5
15	0.11411 ⁺⁶	0.05057 ⁻ 2	30	0.11294 ⁻¹¹	0.05110 ⁺ 5
16	0.11417 ⁺	0.05055 ⁻	Oct. 1	0.11283 ⁻	0.05115 ⁺

GEOCENTRIC DISTANCE AND LIGHT-TIME OF SATURN

Date	$\frac{r}{\Delta}$	Light-time	Date	$\frac{r}{\Delta}$	Light-time
Oct. 1	0.11283 ₋₁₁	^d 0.05115 ⁺ 5	Nov. 16	0.10552 ₋₁₈	^d 0.05469 ⁺ 10
2	.11272 ₁₂	.05120 ₅	17	.10534 ₁₈	.05479 ₉
3	.11260 ₁₂	.05125 ₆	18	.10516 ₁₈	.05488 ₉
4	.11248 ₁₂	.05131 ₅	19	.10498 ₁₈	.05497 ₁₀
5	.11236 ₁₃	.05136 ₆	20	.10480 ₁₉	.05507 ₉
6	0.11223 ₋₁₃	0.05142 ⁺ 6	21	0.10461 ₋₁₈	0.05516 ⁺ 10
7	.11210 ₁₃	.05148 ₆	22	.10443 ₁₈	.05526 ₁₀
8	.11197 ₁₃	.05154 ₆	23	.10425 ₁₈	.05536 ₉
9	.11184 ₁₃	.05160 ₆	24	.10407 ₁₈	.05545 ₁₀
10	.11170 ₁₄	.05166 ₇	25	.10389 ₁₇	.05555 ₉
11	0.11156 ₋₁₄	0.05173 ⁺ 6	26	0.10372 ₋₁₈	0.05564 ⁺ 10
12	.11142 ₁₄	.05179 ₇	27	.10354 ₁₈	.05574 ₉
13	.11128 ₁₅	.05186 ₇	28	.10336 ₁₈	.05583 ₁₀
14	.11113 ₁₄	.05193 ₇	29	.10318 ₁₇	.05593 ₁₀
15	.11099 ₁₅	.05200 ₇	30	.10301 ₁₈	.05603 ₉
16	0.11084 ₋₁₅	0.05207 ⁺ 7	Dec. 1	0.10283 ₋₁₇	0.05612 ⁺ 10
17	.11069 ₁₆	.05214 ₇	2	.10266 ₁₈	.05622 ₉
18	.11053 ₁₅	.05221 ₇	3	.10248 ₁₇	.05631 ₁₀
19	.11038 ₁₆	.05228 ₈	4	.10231 ₁₇	.05641 ₉
20	.11022 ₁₆	.05236 ₈	5	.10214 ₁₇	.05650 ₁₀
21	0.11006 ₋₁₆	0.05244 ⁺ 7	6	0.10197 ₋₁₇	0.05660 ⁺ 9
22	.10990 ₁₆	.05251 ₈	7	.10180 ₁₇	.05669 ₁₀
23	.10974 ₁₇	.05259 ₈	8	.10163 ₁₇	.05679 ₉
24	.10957 ₁₆	.05267 ₈	9	.10146 ₁₇	.05688 ₉
25	.10941 ₁₇	.05275 ₈	10	.10129 ₁₆	.05697 ₁₀
26	0.10924 ₋₁₇	0.05283 ⁺ 8	11	0.10113 ₋₁₇	0.05707 ⁺ 9
27	.10907 ₁₇	.05291 ₈	12	.10096 ₁₆	.05716 ₉
28	.10890 ₁₇	.05299 ₉	13	.10080 ₁₆	.05725 ₉
29	.10873 ₁₇	.05308 ₈	14	.10064 ₁₆	.05734 ₁₀
30	.10856 ₁₈	.05316 ₉	15	.10048 ₁₆	.05744 ₉
31	0.10838 ₋₁₇	0.05325 ⁺ 8	16	0.10032 ₋₁₆	0.05753 ⁺ 9
Nov. 1	.10821 ₁₈	.05333 ₉	17	.10016 ₁₆	.05762 ₉
2	.10803 ₁₇	.05342 ₉	18	.10000 ₁₅	.05771 ₉
3	.10786 ₁₈	.05351 ₈	19	.09985 ₁₅	.05780 ₉
4	.10768 ₁₈	.05359 ₉	20	.09970 ₁₆	.05789 ₈
5	0.10750 ₋₁₇	0.05368 ⁺ 9	21	0.09954 ₋₁₅	0.05797 ⁺ 9
6	.10733 ₁₈	.05377 ₉	22	.09939 ₁₅	.05806 ₉
7	.10715 ₁₈	.05386 ₉	23	.09924 ₁₄	.05815 ₉
8	.10697 ₁₈	.05395 ₉	24	.09910 ₁₅	.05824 ₉
9	.10679 ₁₈	.05404 ₉	25	.09895 ₁₄	.05832 ₉
10	0.10661 ₋₁₈	0.05413 ⁺ 10	26	0.09881 ₋₁₅	0.05841 ⁺ 8
11	.10643 ₁₈	.05423 ₉	27	.09866 ₁₄	.05849 ₈
12	.10625 ₁₉	.05432 ₉	28	.09852 ₁₄	.05857 ₉
13	.10606 ₁₈	.05441 ₉	29	.09838 ₁₃	.05866 ₈
14	.10588 ₁₈	.05450 ₁₀	30	.09825 ₁₄	.05874 ₈
15	0.10570 ₋₁₈	0.05460 ⁺ 9	31	0.09811 ₋₁₃	0.05882 ⁺ 8
16	0.10552 ₋₁₈	0.05469 ⁺ 9	32	0.09798 ₋₁₃	0.05890 ⁺ 8

EXPLANATION, 1935

SATELLITES OF SATURN

Date	MIMAS			ENCELADUS		TETHYS		DIONE	
	L	M	θ	L	M	L	θ	L	M
May 28	158°452	227°1	353°0	356°818	238°7	48°118	249°2	237°914	212°1
June 7	18°284	76°9	343°4	104°133	342°6	155°101	247°2	113°263	86°6
17	238°115	286°8	333°4	211°448	86°5	262°085	245°2	348°612	321°1
27	97°946	136°6	323°4	318°761	190°5	9°068	243°3	223°961	195°6
July 7	317°778	346°4	313°4	66°075	294°4	116°052	241°3	99°310	70°1
17	177°609	196°2	303°4	173°388	38°3	223°036	239°3	334°658	304°6
27	37°440	46°1	293°4	280°700	142°3	330°019	237°3	210°007	179°1
Aug. 6	257°271	255°9	283°4	28°012	246°2	77°003	235°3	85°356	53°6
16	117°102	105°7	273°4	135°323	350°1	183°986	233°4	320°705	288°1
26	336°933	315°5	263°4	242°634	94°1	290°970	231°4	196°054	162°7
Sept. 5	196°764	165°3	253°4	349°945	198°0	37°953	229°4	71°403	37°2
15	56°595	15°2	243°4	97°255	301°9	144°937	227°4	306°753	271°7
25	276°426	225°0	233°4	204°564	45°9	251°920	225°4	182°102	146°2
Oct. 5	136°257	74°8	223°4	311°873	149°8	358°904	223°5	57°451	20°7
15	356°088	284°6	213°4	59°182	253°7	105°887	221°5	292°800	255°2
25	215°918	134°5	203°4	166°491	357°7	212°871	219°5	168°149	129°7
Nov. 4	75°749	344°3	193°4	273°799	101°6	319°855	217°5	43°498	4°2
14	295°580	194°1	183°4	21°106	205°5	66°838	215°6	278°848	238°7
24	155°410	43°9	173°4	128°414	309°4	173°822	213°6	154°197	113°2
Dec. 4	15°241	253°7	163°4	235°721	53°4	280°805	211°6	29°546	347°7
14	235°071	103°6	153°4	343°027	157°3	27°789	209°6	264°895	222°3
24	94°902	313°4	143°4	90°334	261°2	134°773	207°6	140°245	96°8
34	314°732	163°2	133°4	197°640	5°2	241°756	205°7	15°594	331°3
Motion in 10 ^d	3819°831	3809°8	-10°0	2627°3..	2623°9	1906°983	-2°0	1315°349	1314°5

Mimas

$$u = L + 2^\circ.303 \sin M + 0^\circ.029 \sin 2M$$

$$\frac{r}{a} = 1.0002 - 0.0201 \cos M - 0.0002 \cos 2M$$

$$A = 255''.9 \quad \sin \gamma = 0.0265$$

Enceladus

The motion of L in 10^d varies from 2627°·315 to 2627°·306.

$$u = L + 0^\circ.509 \sin M$$

$$\frac{r}{a} = 1 - 0.0044 \cos M$$

$$A = 328''.3 \quad \sin \gamma = 0.0004$$

$$u - \theta = 117^\circ + 263^\circ.15 \text{ (J.D. - 242 8000.5)}$$

Tethys

$$u = L \quad \frac{r}{a} = 1$$

$$A = 406''.4 \quad \sin \gamma = 0.0191$$

Dione

$$u = L + 0^\circ.253 \sin M$$

$$\frac{r}{a} = 1 - 0.0022 \cos M$$

$$A = 520''.5 \quad \sin \gamma = 0.0004$$

$$u - \theta = 255^\circ + 131^\circ.62 \text{ (J.D. - 242 8000.5)}$$

Mimas

$u-U$	F	$u-U$
0°0	0.9999	360°0
67°3	1.0000	292°7
112°6	1.0001	247°4
247°3		112°7

Tethys

$u-U$	F	$u-U$
0°0	0.9998	360°0
43°4	0.9999	316°6
75°9	1.0000	284°1
104°0	1.0001	256°0
136°5	1.0002	223°5
223°4		136°6

Enceladus

$u-U$	F	$u-U$
0°0	0.9998	360°0
25°9	0.9999	334°1
72°5	1.0000	287°5
107°4	1.0001	252°6
154°0	1.0002	206°0
205°9		154°1

In critical cases
ascend.

Dione

$u-U$	F	$u-U$
0°0	0.9997	360°0
19°0	0.9998	341°0
55°4	0.9999	304°6
79°1	1.0000	280°9
100°8	1.0001	259°2
124°5	1.0002	235°5
160°0	1.0003	199°1
190°0		161°0

SATELLITES OF SATURN

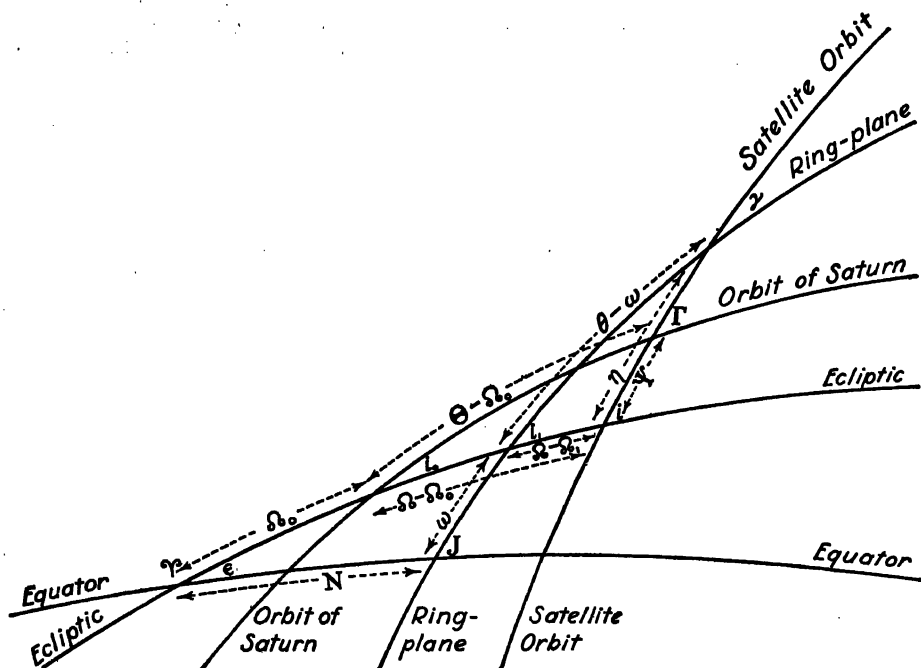
Date	RHEA				TITAN				
	L	M	θ	$\sin \gamma$	L	M	θ	$\sin \gamma$	e
May 28	87°325	271°4	270°7	0.00629	117°055	303°93	214°93	0.00615	0.02900
June 7	164°225	348°3	270°5	0.00629	342°824	169°68	214°91	0.00615	0.02900
17	241°124	65°3	270°2	0.00630	208°593	35°44	214°90	0.00615	0.02900
27	318°024	142°2	270°0	0.00630	74°362	261°20	214°88	0.00615	0.02900
July 7	34°924	219°2	269°7	0.00630	300°131	126°95	214°87	0.00615	0.02900
17	111°824	296°2	269°4	0.00630	165°900	352°71	214°85	0.00615	0.02900
27	188°723	13°1	269°2	0.00631	31°668	218°46	214°84	0.00614	0.02900
Aug. 6	265°623	90°1	268°9	0.00631	257°437	84°22	214°82	0.00614	0.02900
16	342°523	167°1	268°6	0.00631	123°206	309°97	214°81	0.00614	0.02900
26	59°422	244°0	268°4	0.00631	348°975	175°73	214°79	0.00614	0.02899
Sept. 5	136°322	321°0	268°1	0.00631	214°744	41°49	214°78	0.00614	0.02899
15	213°222	38°0	267°9	0.00632	80°513	267°24	214°76	0.00614	0.02899
25	290°121	114°9	267°6	0.00632	306°282	133°00	214°74	0.00614	0.02899
Oct. 5	7°021	191°9	267°3	0.00632	172°050	358°75	214°73	0.00614	0.02899
15	83°921	268°9	267°1	0.00632	37°819	224°51	214°71	0.00614	0.02899
25	160°821	345°8	266°8	0.00632	263°588	90°26	214°70	0.00614	0.02899
Nov. 4	237°720	62°8	266°5	0.00632	129°357	316°02	214°68	0.00614	0.02899
14	314°620	139°8	266°3	0.00633	355°126	181°78	214°67	0.00614	0.02899
24	31°520	216°7	266°0	0.00633	220°895	47°53	214°65	0.00613	0.02899
Dec. 4	108°419	293°7	265°8	0.00633	86°664	273°29	214°63	0.00613	0.02898
14	185°319	10°7	265°5	0.00633	312°432	139°04	214°62	0.00613	0.02898
24	262°219	87°6	265°2	0.00633	178°201	4°80	214°60	0.00613	0.02898
34	339°119	164°6	265°0	0.00634	43°970	230°55	214°59	0.00613	0.02898
Motion in 10^4	796.900	796.9	-0.3	...	225.769	225.76	-0.02	...	...

The motions in 10^4 may differ from those given by a unit in the last decimal.

The motions in 10 ^d may differ from those given by a unit in the last decimal.		<i>Rhea</i>			<i>Titan</i>		
		<i>u-U</i>	<i>F</i>	<i>u-U</i>	<i>u-U</i>	<i>F</i>	<i>u-U</i>
<i>Rhea</i> (for opposition of 1935)		0°0		360°0	0°0		360°0
$u = L + 0^{\circ}.078 \sin M$		18.6	0.9996	341°4	6.8	0.9991	353°2
$\frac{r}{a}$		47.4	.9997	312°6	28.8	.9992	331°2
$= 1 - 0.00068 \cos M$		66.0	.9998	294°0	40.5	.9993	319°5
$A = 726''.9$	$e = 0.00068$	82.2	0.9999	277°8	50.0	.9994	310°0
		97.7	1.0000	262°3	58.2	.9995	301°8
		113.9	.0001	246°1	65.8	.9996	294°2
		132.5	.0002	227°5	73.0	.9997	287°0
		161.3	.0003	198°7	79.9	.9998	280°1
		198.6	1.0004	161°4	86.6	0.9999	273°4
					93.3	1.0000	266°7
					100.0	.0001	260°0
					106.9	.0002	253°1
					114.1	.0003	245°9
					121.7	.0004	238°3
					129.9	.0005	230°1
					139.4	.0006	220°6
					151.1	.0007	208°9
					173.1	.0008	186°9
					186.8	1.0009	173°2
<i>Titan</i>					In critical cases ascend.		
$F = 1 - \frac{0.00817}{\Delta} \frac{r}{a} \cos(u-U)$							
if 5 decimals are required							
$u = L + 3^{\circ}.323 \sin M + 0^{\circ}.060 \sin 2M$	May 28-Aug. 23						
$= L + 3^{\circ}.322 \sin M + 0^{\circ}.060 \sin 2M$	Aug. 24-Nov. 18						
$= L + 3^{\circ}.321 \sin M + 0^{\circ}.060 \sin 2M$	Nov. 19-Dec. 34						
$\frac{r}{a} = 1.00042 - e \cos M - 0.00042 \cos 2M$	$A = 1684''.4$						
$x = \frac{A}{\Delta} \frac{r}{a} F \sin(u-U)$							
$y = \frac{A}{\Delta} \frac{r}{a} F \{ \sin B \cos(u-U) + \cos B \sin \gamma \sin(u-\theta) \}$							

to the node on Saturn's orbit, and may be taken as $4^{\circ}.63$ till 1950. The expressions for Π and e then become

$$\begin{aligned}\Pi &= 276^{\circ}.2914 + 0^{\circ}.5235 t + 0^{\circ}.3667 \sin 2g \\ e &= 0.028933 - 0.000186 \cos 2g\end{aligned}$$



All the satellites are subject to periodic solar perturbations. The effect of these on the times of phenomena such as transits, eclipses, shadow transits and occultations is inappreciable except in the case of Titan, where it may amount to 2^m . Hence the following perturbations, as given by H. Struve in *Supplément I* and quoted by G. Struve in *Heft 5* (see previous references) have been applied to Titan.

- l_0 = mean longitude of Saturn
- n_0 = mean daily motion of Saturn in longitude
- Ω_0 = mean longitude of the ascending node of Saturn's orbit on the ecliptic
- i_0 = inclination of Saturn's orbit to the ecliptic
- Π_0 = mean longitude of perihelion of Saturn
- e_0 = eccentricity of Saturn's orbit
- Θ = longitude of the node of the satellite orbit on Saturn's orbit
- Γ = inclination of the satellite orbit to Saturn's orbit
- Ψ = distance from the ecliptic to Saturn's orbit, measured in the satellite orbit
- η = distance from the ascending node of the satellite orbit on the ecliptic to its ascending node on the ring-plane.

The perturbations are given by

$$\Delta E = -3 \frac{n_0}{n} \left\{ e_0 \sin(l_0 - \Pi_0) + \frac{3}{2} e_0^2 \sin 2(l_0 - \Pi_0) \right. \\ \left. + \frac{1}{2} \frac{3}{2} e^2 \sin 2(l_0 - \Pi) + \frac{3}{16} \sin^2 \Gamma \sin 2(l_0 - \Theta) \right\}$$

$$\Delta \Omega = \frac{3}{8} \frac{n_0}{n} \frac{\sin \Gamma}{\sin i} \sin(2l_0 - 2\Theta + \Psi)$$

$$\Delta i = \frac{3}{8} \frac{n_0}{n} \sin \Gamma \cos(2l_0 - 2\Theta + \Psi)$$

$$\Delta \Pi = \frac{1}{8} \frac{n_0}{n} \sin 2(l_0 - \Pi)$$

$$\Delta e = \frac{1}{8} \frac{n_0}{n} e \cos 2(l_0 - \Pi)$$

Converting these into perturbations of the quantities tabulated,

$$\Delta L = \Delta E - 2 \sin \frac{1}{2} i \sin \frac{1}{2} i_1 \Delta \Omega$$

$$\Delta M = \Delta E - \Delta \Pi$$

$$\sin \gamma \Delta \theta = \sin i \cos \eta \Delta \Omega - \sin \eta \Delta i$$

$$\Delta \gamma = \sin i \sin \eta \Delta \Omega + \cos \eta \Delta i$$

Hill's *Tables of Saturn* do not give the variation of the elements, so it is more convenient to use Le Verrier's elements, which are as follows.

$$\text{Epoch} = 1900 \text{ January } 1.0 \text{ G.M.T.} = \text{J.D. } 241\,5021.0$$

$$l_0 = 266^\circ.598 + 1223^\circ.510 T$$

$$\Omega_0 = 112^\circ.791 + 0^\circ.873 T$$

$$i_0 = 2^\circ.493 - 0^\circ.004 T$$

$$\Pi_0 = 91^\circ.098 + 1^\circ.958 T$$

$$e_0 = 0.055892 - 0.000345 T$$

where T is measured in Julian centuries of 36525 days.

The quantities Θ , Γ and Ψ are found from

$$\sin \Gamma \sin(\Theta - \Omega_0) = \sin i \sin(\Omega - \Omega_0)$$

$$\sin \Gamma \cos(\Theta - \Omega_0) = -\cos i \sin i_0 + \sin i \cos i_0 \cos(\Omega - \Omega_0)$$

$$\cos \Gamma = \cos i \cos i_0 + \sin i \sin i_0 \cos(\Omega - \Omega_0)$$

$$\sin \Gamma \sin \Psi = \sin i_0 \sin(\Omega - \Omega_0)$$

$$\sin \Gamma \cos \Psi = \sin i \cos i_0 - \cos i \sin i_0 \cos(\Omega - \Omega_0)$$

If, in order to cover the period 1927-1954, we put

$$\text{Epoch} = 1941 \text{ January } 6.0 \text{ G.M.T.} = \text{J.D. } 243\,0000.5$$

j = number of days from epoch

$$A = l_0 - \Pi_0 = 316^\circ.48 + 0^\circ.033444 j$$

$$B = 2(l_0 - \Pi) = 211^\circ.48 + 0^\circ.064136 j$$

$$C = 2(l_0 - \Theta) = 111^\circ.03 + 0^\circ.066950 j$$

$$D = 2l_0 - 2\Theta + \Psi = 115^\circ.66 + 0^\circ.066950 j$$

$$a = \frac{3}{8} \frac{n_0}{n} 57.296 \sin \Gamma \cos \eta \operatorname{cosec} \gamma$$

$$b = -\frac{3}{8} \frac{n_0}{n} 57.296 \sin \Gamma \sin \eta \operatorname{cosec} \gamma$$

$$c = \frac{3}{8} \frac{n_0}{n} \sin \Gamma \sin \eta$$

$$d = \frac{3}{8} \frac{n_0}{n} \sin \Gamma \cos \eta$$

then

$$\Delta E = -0^{\circ} \cdot 01422 \sin A - 0^{\circ} \cdot 00059 \sin 2A - 0^{\circ} \cdot 00020 \sin B \\ - 0^{\circ} \cdot 00945 \sin C$$

$$\Delta \Omega = +0^{\circ} \cdot 03046 \sin D$$

$$\Delta i = +0^{\circ} \cdot 01417 \cos D$$

$$\Delta \Pi = +0^{\circ} \cdot 1594 \sin B$$

$$\Delta e = +0 \cdot 00008 \, 06 \cos B$$

$$\Delta L = \Delta E - 0^{\circ} \cdot 00354 \sin D$$

$$\Delta M = \Delta E - \Delta \Pi$$

$$\Delta \theta = a \sin D + b \cos D \quad \text{in degrees}$$

$$\Delta(\sin \gamma) = c \sin D + d \cos D$$

The values of a , b , c and d , at intervals of 1000 days, are given in the table below, c and d being in units of the 7th decimal.

Date	J.D.	a	b	c	d
1927 Apr. 30.0	242 5000.5	-2.119	-0.393	+451	-2431
1930 Jan. 24.0	242 6000.5	2.147	.361	410	2439
1932 Oct. 20.0	242 7000.5	2.174	.327	367	2446
1935 July 17.0	242 8000.5	2.199	.290	323	2452
1938 Apr. 12.0	242 9000.5	2.222	.251	278	2458
1941 Jan. 6.0	243 0000.5	2.243	.210	231	2463
1943 Oct. 3.0	243 1000.5	2.262	.168	183	2467
1946 June 29.0	243 2000.5	-2.279	-0.123	+134	-2470

The true longitude u in the orbit, reckoned in the same way as L , and the ratio of the radius vector r to the semi-major axis a , are found from

$$u = L + (v - M)$$

$$v - M = 57^{\circ} \cdot 2958 (2e \sin M + 1.25 e^2 \sin 2M)$$

$$\frac{r}{a} = 1 + \frac{1}{2}e^2 - e \cos M - \frac{1}{2}e^2 \cos 2M$$

The rectangular co-ordinates of a satellite, measured in seconds of arc and referred to axes through the centre of Saturn, the axis of x being in the ring-plane and positive towards the east, and the axis of y being directed positively towards the north pole of Saturn, are

$$x = \frac{A}{\Delta} \frac{r}{a} F \sin(u - U)$$

$$y = \frac{A}{\Delta} \frac{r}{a} F \{ \sin B \cos(u - U) + \cos B \sin \gamma \sin(u - \theta) \}$$

in which the second term in y can often be neglected, and where

$$F = \frac{\Delta}{\Delta + r \cos(u - U)}$$

in which Δ may usually be given its mean value of 9.53887 , and r taken as a , so that F may be tabulated for each satellite with argument $u - U$. F is identical with

the quantity called $\frac{1}{1 + \xi}$ by Marth and Struve.

The distance s of the satellite from the centre of Saturn, and its position angle p , may be found from

$$s \sin(p - P) = x$$

$$s \cos(p - P) = y$$

The differences of right ascension and declination, in the sense satellite *minus* Saturn, are

$$\Delta\alpha = \frac{1}{r} s \sin p \sec(\delta + \Delta\delta)$$

$$\Delta\delta = s \cos(p + \frac{1}{2}\Delta\alpha \sin \delta)$$

$$= s \cos p - \frac{2s}{4} \Delta\alpha^2 \sin 2\delta \sin r''$$

in which the second term in $\Delta\delta$ may be neglected.

In the above no allowance is made for light-time, which must be added to the computed time of any phenomenon, or subtracted from the observed time. The light-time is strictly $498^s.58 F\Delta$, but may be taken as

$$\text{Light-time} = 498^s.6 \Delta = 8^m.310 \Delta = 0^d.005771 \Delta$$

The values of $\frac{1}{\Delta}$ and the light-time are tabulated on pages 838–839.

Satellites of Uranus and Neptune (Pages 636–639)

The data concerning Ariel and Umbriel, the inner satellites of Uranus, are derived from elements given by Newcomb in *Uranian and Neptunian Systems, Washington Observations*, 1873, Appendix I. The data concerning Titania and Oberon, the outer satellites of Uranus, are derived from elements given by H. Struve in *Abhandlungen der Königlich Preussischen Akademie der Wissenschaften*, 1912.

The data concerning the satellite of Neptune are derived from elements given by Eichelberger and Newton in *The Orbit of Neptune's Satellite and the Pole of Neptune's Equator*, in *Astronomical Papers of the American Ephemeris*, Vol. IX, Part III.

The symbols used are explained under *Satellites of Mars*.

Magnitudes of Uranus and Neptune

These may be found from Müller's formulæ:—

$$\text{For Uranus } m = -6.85 + 5 \log r\Delta$$

$$\text{For Neptune } m = -7.05 + 5 \log r\Delta$$

On account of the small variation of r the formulæ may be simplified:—

$$\text{For Uranus } m = m_0 + 5 \log \Delta$$

$$\text{For Neptune } m = +0.35 + 5 \log \Delta$$

where m_0 has the following values:—

1931	−0.35	1934	−0.36	1937	−0.38
1932	−0.35	1935	−0.37	1938	−0.38
1933	−0.36	1936	−0.37	1939	−0.39

The magnitudes at opposition in 1935 are

Uranus 6.0

Neptune 7.7

Phenomena (Pages 640–641)

The symbols used are defined on page 750, although the majority will be found on the lower half of page 641.

The times of equinoxes and solstices are those at which the Sun's apparent longitude is a multiple of 90° . The dates of perihelion and aphelion are those on which the radius vector of the Sun is a minimum and maximum respectively. On

account of perturbations they are not always the same as the dates on which the longitude of the Sun is equal to the mean longitude of perigee or apogee given on page 54.

For solar eclipses the time of conjunction in right ascension is given, and for lunar eclipses the time of mid-eclipse.

The dates of greatest brilliancy of Venus are those on which the expression

$$\frac{(r + \Delta + R)(r + \Delta - R)}{r^3 \Delta^3}$$

is a maximum, r and R being the radii vectores of Venus and the Earth respectively, and Δ the geocentric distance of Venus.

The dates of conjunction with or opposition to the Sun are those on which the differences of apparent geocentric longitude are 0° and 180° respectively. The dates when the planets are stationary are those on which they are stationary in right ascension. Similarly the dates of elongation are those on which the differences of geocentric longitude are a maximum, no account being taken of the latitude of the planet concerned.

The times of conjunction of planets with the Moon or with one another are those at which the two bodies have the same right ascension, and in general, differ slightly from the times of closest approach. The conjunctions of planets with the Moon are omitted if the difference of declination is greater than 7° , and also, in the case of Uranus and Neptune, if the conjunction occurs within 48 hours of New Moon. The conjunctions of planets in pairs are omitted if the difference of declination is greater than 3° . Conjunctions of planets with first magnitude stars are given when the difference of declination at conjunction does not exceed $10'$.

Sunrise and Sunset (Pages 642–663)

This table enables the time of sunrise or sunset at any place between the equator and latitude $+60^\circ$ to be obtained immediately. The times given may be regarded as local mean times of sunrise or sunset, although strictly they are the Greenwich mean times of sunrise or sunset for places on the meridian of Greenwich, and an interpolation for longitude (yielding a maximum correction of 1^m) is theoretically necessary in order to give the local mean time for a place not on the meridian of Greenwich.

At the times given the true zenith distance of the Sun's centre is $90^\circ 50', 34'$ having been allowed for horizontal refraction and $16'$ for semi-diameter. The beginning of morning twilight and end of evening twilight are the instants when the true zenith distance of the Sun's centre is 108° .

In order to avoid the necessity for a special table for southern latitudes, the time of sunrise or sunset at a southern station is found by taking the time of the same phenomenon at a northern station at the same distance from the equator on the day (about six months earlier or later) when the Sun's declination is opposite in sign but as nearly as possible equal in numerical value. To the time thus found must be applied a correction equal to the difference between the values of the equation of time on the two dates concerned. The required dates and corrections are tabulated on pages 662–663.

Moonrise and Moonset (Pages 664–681)

At the times given the true geocentric zenith distance of the Moon's centre is $90^\circ 50'$ minus the Moon's horizontal parallax. Here, as in the case of the Sun, $34'$ has been allowed for horizontal refraction and $16'$ for semi-diameter.

A special table for southern latitudes is avoided by making use of the fact that, if there were no refraction or parallax, the time of rising or setting of the Moon's centre at any place would be exactly the same as the time of setting or rising at a point on the Earth diametrically opposite this place. The corrections required to allow for refraction, semi-diameter and parallax are equal in magnitude for the two places but opposite in sign. As the correction has already been applied in the case of northern stations, it must be doubled and applied with the opposite sign in order to give correct times for southern stations; it is computed by means of the table on page 680.

The hour angle of the Moon is given by

$$\cos h = -\tan \phi \tan \delta + \cos z \sec \phi \sec \delta$$

where z is the zenith distance. Here $z = 90^\circ 50' - \pi$, and does not differ from 90° by more than $11'$. Hence the hour angle when $z = 90^\circ$ must be corrected by

$$\begin{aligned} & \pm \frac{\sec \phi \sec \delta \sin(\pi - 50') \operatorname{cosec} 1^m}{\sqrt{1 - \tan^2 \phi \tan^2 \delta}} \\ & = \pm \frac{\sqrt{2} \sin(\pi - 50') \operatorname{cosec} 1^m}{\sqrt{\cos 2\phi + \cos 2\delta}} \end{aligned}$$

in minutes of sidereal time. This correction must be reduced to minutes of mean time, and allowance made for the average hourly motion of the Moon in right ascension, which may be taken as 132^s . Thus the factor on page 680 is

$$\pm \frac{2 \times \sqrt{2} \times 3610}{15 (3610 - 132) \sqrt{\cos 2\phi + \cos 2\delta}} = \pm \frac{0.196}{\sqrt{\cos 2\phi + \cos 2\delta}}$$

The rule for signs follows immediately from the consideration that the geocentric zenith distance of the Moon's centre at the times given is always less than 90° .

Observatories (Pages 682-703)

Three separate lists of observatories are given,

List A.—Active Observatories.—The positions given are based on replies sent by the various observatories to letters asking for their geographical co-ordinates. Six observatories have been added to this list since 1934, namely Cape of Good Hope, Kitab, Lake Angelus, Morwenstow, Muswell Hill and Oak Ridge. Revised data are given for Bogota, Leiston and Stockholm. Frome and Pennant Hills have been transferred to List B.

In the quantities $\rho \sin \phi'$, $\rho \cos \phi'$, etc. the effect of altitude has been included in every case where it is known. The formulæ and tables used are given on pages 726 and 727, in Tables X and XI.

List B.—Former Observatories.—This list includes not only observatories that have ceased to exist or be active, but also former positions of active observatories in List A. In general only observatories of historical importance have been included. Certain omissions are due to the difficulty of obtaining the necessary data. Frome, Lund, Pennant Hills and Stockholm have been added to the list since 1934.

List C.—Index List.—Lists A and B are given in alphabetical geographical order. As many observatories are better known by special names, or by the name of the individual or institution to which they belong, List C provides a means of locating them in one of the other lists. Names of towns or suburban or country locations sometimes associated with observatories are included. References are also given in this list to all branch observatories.

The authority for the spelling of all geographical names is the leaflets published for the Permanent Committee on Geographical Names by the Royal Geographical Society, Kensington Gore, London, S.W.7.

Every effort is made to keep this list of observatories up to date. Directors and others concerned are requested to communicate corrections or additions.

Standard Times (Pages 704-713)

These pages show the standard times adopted in various countries. They also indicate the difference between the standard time of any country and Greenwich mean time in the sense Greenwich mean time *minus* standard time. As changes are liable to occur in this list users should consult the latest *Nautical Almanac* available.

In many countries the legal time is advanced during a portion of the year, and this advanced time is commonly known as *Summer Time*. In the British Isles this practice began in 1916, and was stabilised by the *Summer Time Act, 1925*, which enacted that

(1) The time for general purposes in Great Britain shall, during the period of summer time, be one hour in advance of Greenwich mean time.

(2) Wherever any reference to a point of time occurs in any enactment, Order in Council, order, regulation, rule, byelaw, deed, notice or other document whatsoever, the time referred to shall, during the period of summer time, be deemed, subject as hereinafter provided, to be the time as fixed for general purposes by this Act.

(3) Nothing in this Act shall affect the use of Greenwich mean time for purposes of astronomy, meteorology, or navigation, or affect the construction of any document mentioning or referring to a point of time in connection with any of those purposes.

(4) For the purposes of this Act, the period of summer time shall be taken to be the period beginning at two o'clock, Greenwich mean time, in the morning of the day next following the third Saturday in April, or, if that day is Easter Day, the day next following the second Saturday in April, and ending at two o'clock, Greenwich mean time, in the morning of the day next following the first Saturday in October.

The duration of Summer Time is given below for the years 1916 to 1939. The dates for the years 1916 to 1924 do not conform to the rule now in force.

Year	Duration	Year	Duration
1916	May 21 to October 1	1928	April 22 to October 7
1917	April 8 to September 17	1929	April 21 to October 6
1918	March 24 to September 30	1930	April 13 to October 5
1919	March 30 to September 29	1931	April 19 to October 4
1920	March 28 to October 25	1932	April 17 to October 2
1921	April 3 to October 3	1933	April 9 to October 8
1922	March 26 to October 8	1934	April 22 to October 7
1923	April 22 to September 16	1935	April 14 to October 6
1924	April 13 to September 21	1936	April 19 to October 4
1925	April 19 to October 4	1937	April 18 to October 3
1926	April 18 to October 3	1938	April 10 to October 2
1927	April 10 to October 2	1939	April 16 to October 8

Tables I and II (Pages 714-717)

These tables enable the *Julian Day Number* of any day up to the year 2000 to be found. When a decimal is used with a Julian Day Number it is understood that the day commences at Greenwich mean noon.

Tables III and IV (Pages 718-719)

These tables are used for converting intervals of mean solar time into intervals of *uniform* sidereal time (see page 774) and vice versa. They are based on the following conversion ratios derived from Newcomb's value of the tropical year:—

1 mean solar day = 1.00273 79093 uniform sidereal days
= 24^h 03^m 56^s.55536 in uniform sidereal time

1 uniform sidereal day = 0.99726 95664 mean solar days
= 23^h 56^m 04^s.09054 in mean solar time.

When three decimals of a second are retained, as in the most refined modern time-keeping, these tables are used for connecting mean solar and uniform sidereal times. When keeping time to 0^s.01 only, the tables are used in the manner illustrated for connecting mean solar and true sidereal times.

Tables V-IX (Pages 720-725)

These conversion tables do not require explanation. Decimals of a day may be converted to hours, minutes and seconds by the inverse use of Table IX.

Tables X and XI (Pages 726-727)

These tables are based on a compression c of $\frac{1}{297.0}$. The series on which they are based, together with the series for ρ , the ratio of the radius to the equatorial radius, are given below, with terms up to c^3 .

$$S = \frac{\rho \sin \phi'}{\sin \phi} = 1 - \frac{3}{2}c + \frac{5}{16}c^2 + \frac{3}{32}c^3 - \left(\frac{1}{2}c - \frac{1}{2}c^2 - \frac{5}{64}c^3\right) \cos 2\phi$$

$$+ \left(\frac{3}{16}c^2 - \frac{3}{32}c^3\right) \cos 4\phi - \frac{5}{64}c^3 \cos 6\phi$$

$$C = \frac{\rho \cos \phi'}{\cos \phi} = 1 + \frac{1}{2}c + \frac{5}{16}c^2 + \frac{7}{32}c^3 - \left(\frac{1}{2}c + \frac{1}{2}c^2 + \frac{27}{64}c^3\right) \cos 2\phi$$

$$+ \left(\frac{3}{16}c^2 + \frac{9}{32}c^3\right) \cos 4\phi - \frac{5}{64}c^3 \cos 6\phi$$

$$\rho = 1 - \frac{1}{2}c + \frac{5}{16}c^2 + \frac{5}{32}c^3 + \left(\frac{1}{2}c - \frac{13}{64}c^3\right) \cos 2\phi$$

$$- \left(\frac{5}{16}c^2 + \frac{5}{32}c^3\right) \cos 4\phi + \frac{13}{64}c^3 \cos 6\phi$$

These reduce to

$$S = 0.9949\ 5304 - 0.0016\ 7783 \cos 2\phi + 0.0000\ 0212 \cos 4\phi$$

$$C = 1.0016\ 8705 - 0.0016\ 8919 \cos 2\phi + 0.0000\ 0214 \cos 4\phi$$

$$\rho = 0.9983\ 2005 + 0.0016\ 8349 \cos 2\phi - 0.0000\ 0355 \cos 4\phi + 0.0000\ 0001 \cos 6\phi$$

Table XII (Pages 728-729)

This table enables approximate precessions to 0^s.01 and 0^s.1 for declinations less than $\pm 60^\circ$ to be found at sight.

Tables XIII and XIV (Pages 730-734)

These tables are for the rigorous reduction of star positions from the equinox of the beginning of the year to that of 1950.0, and will be useful in cases where accurate precessions and secular variations are not known. They have the advantage of involving functions of the right ascension and declination at the initial epoch only, and not at the mid-epoch. They are based on Ristenpart's formulæ:—

$$\begin{aligned} a &= a_0 + \zeta_0 & A &= \zeta_0 + z + \frac{\sin^2 \theta \sin 2a}{60 \sin 1''} \\ A_1 &= \frac{\sin \theta \sin a}{15 \sin 1''} & A_2 &= \frac{\sin^2 \theta \sin 2a}{30 \sin 1''} \\ D &= \frac{\sin \theta \cos a}{\sin 1''} & D_1 &= -\frac{\sin^2 \theta \sin^2 a}{2 \sin 1''} \end{aligned}$$

where A , A_1 and A_2 are measured in time, and D and D_1 in arc.

These reduce, for working purposes, to

$$\begin{aligned} A &= \zeta_0 + z + \frac{1}{2}A_2 = M + \frac{1}{2}A_2 \\ p &= \frac{\sin \theta \cos \zeta_0}{15 \sin 1''} & q &= \frac{\sin \theta \sin \zeta_0}{15 \sin 1''} \\ A_1 &= p \sin a + q \cos a \\ A_2 &= 0.0000048481 A_1 D \\ D &= -15 \times \text{value of } A_1 \text{ for } (a - 6^h) \\ D_1 &= -0.00054542 A_1^2 \end{aligned}$$

For stars near the pole the formulæ on page 787 may be used.

Table XV (Page 735)

This table is intended to facilitate the approximate reduction of ephemerides of comets and minor planets from the standard equinox of 1950.0 to the true equinox of date. The dates are those adopted in 1928 at the Leiden meeting of the International Astronomical Union in the following resolution: "That the dates used in giving the osculation epochs of elements for comets and minor planets shall be the midnight following an integral Julian date that is exactly divisible by 40, and, for ephemerides, divisible by 8 (or 4 etc.)." The dates marked with an asterisk are the osculation dates.

The formulæ for f , g and G are

$$f = M + f_0$$

M being given on page 54, and being the reduction to the beginning of the year, and f_0 being here the independent day number f given on pages 274-288.

$$g \sin G_0 = \frac{1}{60} B$$

$$g \cos G_0 = N' + n'A$$

$$G = G_0 - 15.5(1950 - 1935)$$

N' and n' being the values of N'' and n'' on page 54 reduced to minutes of arc. n' may be taken as $\frac{1}{2}$, and since $g \sin G_0$ is very small in comparison with $g \cos G_0$

$$g = -g \cos G_0 - \frac{(g \sin G_0)^2}{2g \cos G_0}$$

The quantities j and J on page 294 are related to the quantities g and G as follows:—

$$j = 60 g \sin 1^m = 0.262 g \qquad J = G - 6^h$$

Tables XVI and XVIIA (Pages 736–741)

Table XVI gives the azimuth of *Polaris* at all hour angles for latitudes from 10° to 70° , on the assumption that the declination of *Polaris* is $88^\circ 57' 35''$. It is computed from

$$\tan A = \frac{\sin h \cot \delta \sec \phi}{1 - \cos h \cot \delta \tan \phi}$$

The necessary correction is

$$\begin{aligned} \Delta A &= - \frac{A (\delta - 88^\circ 57' 35'')}{(90^\circ - 88^\circ 57' 35'')} \\ &= -0.000263 A (\delta - 88^\circ 57' 35'') \end{aligned}$$

where $\delta - 88^\circ 57' 35''$ is in seconds of arc. This correction is tabulated in Table XVIIA. It may be remarked that the above differential formula assumes the zenith distance of *Polaris* to be the same as the colatitude.

Tables XVII–XXI (Pages 742–749)

These tables have been included to facilitate interpolation of the quantities in the *Nautical Almanac*. The notation commonly employed in astronomical usage is

Function	Differences				
	First	Second	Third	Fourth	Fifth
f_{-2}	Δ'_{-2}				
f_{-1}	Δ'_{-1}	Δ''_{-1}			
f_0	Δ'_0	Δ''_0	Δ'''_0	Δ^{iv}_0	
	Δ'_1		Δ'''_1		Δ^v_1
f_1	Δ'_1	Δ''_1		Δ^{iv}_1	
	Δ'_2		Δ'''_2		
f_2	Δ'_2	Δ''_2			
f_3					

which, for our present purposes, may be simplified thus:—

Function	Differences			
f_0	Δ'	Δ''_0	Δ'''_0	Δ^{iv}_0
		Δ''_1	Δ'''_1	Δ^{iv}_1
f_1				

If differences are available either Bessel's or a modified Everett formula may be used. Bessel's formula may be written*

$$f_n = f_0 + n\Delta' + B''(\Delta''_0 + \Delta''_1) + B''' \Delta''' + B^{iv}(\Delta^{iv}_0 + \Delta^{iv}_1)$$

* The definitions of B'' and B^{iv} here adopted differ by a factor $\frac{1}{2}$ from those in the *Nautical Almanac* for 1931–34; the change enables double differences to be used instead of mean differences.

where n is the fraction of the interval between two tabular values, and

$$B'' = \frac{n(n-1)}{2 \cdot 2!}$$

$$B''' = \frac{n(n-1)(n-\frac{1}{2})}{3!}$$

$$B^{iv} = \frac{(n+1)n(n-1)(n-2)}{2 \cdot 4!}$$

$$\Delta_0'' + \Delta_1'' = \Delta_{\frac{1}{2}}' - \Delta_{-\frac{1}{2}}'$$

$$\Delta_0^{iv} + \Delta_1^{iv} = \Delta_{\frac{1}{2}}''' - \Delta_{-\frac{1}{2}}'''$$

The modified Everett formula is

$$f_n = f_0 + n\Delta' + E_0''\Delta_0'' + E_1''\Delta_1'' + B^{iv}(\Delta_0^{iv} + \Delta_1^{iv})$$

in which $f_0 + n\Delta'$ may be replaced by $(1-n)f_0 + nf_1$ and where

$$E_0'' = -\frac{n(n-1)(n-2)}{6}$$

$$E_1'' = \frac{(n+1)n(n-1)}{6}$$

The use of four terms of Everett's formula is exactly equivalent to the use of four terms of Bessel's formula, in other words it includes the effect of third differences

It will be observed that

$$B^{iv} = \frac{B''(n+1)(n-2)}{12}$$

The quantity $\frac{(n+1)(n-2)}{12}$ varies over a small range as n varies from 0 to 1. If a constant value -0.184 be assigned to it, and if we write

$$M'' = \Delta'' - 0.184 \Delta^{iv}$$

Bessel's formula becomes

$$f_n = f_0 + n\Delta' + B''(M_0'' + M_1'') + B''\Delta''$$

the error of which is less than half a unit of the last decimal if the fourth difference does not exceed 1000. Similarly Everett's formula may be written

$$f_n = f_0 + n\Delta' + E_0''M_0'' + E_1''M_1''$$

This method, known as the throw-back, enables the effect of a small fourth difference to be taken into account very easily, as Table XXI gives values of $0.184 \Delta^{iv}$ with argument Δ^{iv} . The same principle* can also be applied to higher order differences, for instance $M''' = \Delta''' - \frac{1}{6}\Delta^{iv}$ can be used up to $\Delta'' = 5000$.

The number of differences to be used in any particular problem must be determined by the computer, it is governed by the simple condition that the effect of the neglected differences must be negligible in comparison with the working unit. The maximum effect of second differences, attained when $n = \frac{1}{2}$, is $\frac{1}{8}\Delta''$ or $\frac{1}{16}(\Delta_0'' + \Delta_1'')$, so that second differences may be considered negligible if the double second difference, i.e. $\Delta_0'' + \Delta_1''$, is less than 8. The maximum value of B'' is 0.008, so that third differences less than about 60 may be neglected. Similarly, since the maximum value of B^{iv} , attained when $n = \frac{1}{2}$, is 0.012, fourth differences are negligible if the double fourth difference $\Delta_0^{iv} + \Delta_1^{iv}$ does not exceed 40.

* See "On the Construction of Tables by Interpolation." *M.N.R.A.S.*, 82, 1911; *Nautical Almanac*, 1931, 831, and *British Association Mathematical Tables*, 1928, 101.

average fourth difference does not exceed 20. The effect of fifth differences is always negligible when interpolating quantities in the *Nautical Almanac*; the maximum value of the Besselian coefficient of the fifth difference is less than 0.001.

The choice of formula is often a matter of individual preference, but the following remarks may be found helpful. If the fourth and higher order differences are negligible, Everett's formula has the advantage of avoiding the necessity for finding the third difference—as, for instance, in the Sun's co-ordinates X, Y, Z , where second differences are printed and fourth differences are always negligible. When fourth differences must be included, either formula may be used, either with the term $B''(\Delta_0'' + \Delta_1'')$, or with the throw-back.

Interpolation may be performed without differences. Thus linear interpolation becomes

$$f_n = (1 - n)f_0 + nf_1$$

while interpolation that includes differences up to the third may be done by the 4-point Lagrange formula

$$f_n = L_{-1}f_{-1} + L_0f_0 + L_1f_1 + L_2f_2$$

where

$$L_{-1} = -\frac{n(n-1)(n-2)}{6} = E_0''$$

$$L_0 = \frac{(n+1)(n-1)(n-2)}{2}$$

$$L_1 = -\frac{(n+1)n(n-2)}{2}$$

$$L_2 = \frac{(n+1)n(n-1)}{6} = E_1''$$

$$L_{-1} + L_0 + L_1 + L_2 = 1$$

This formula may also replace the first four terms of Bessel's or Everett's formula, the effect of fourth differences, if appreciable, being applied in the usual way, i.e. by $+B''(\Delta_0'' + \Delta_1'')$. It has been found that cases arise where it is convenient to use Lagrangian formulæ, especially when a calculating machine is being used. The case where $n = \frac{1}{2}$, i.e. when the interval of a table is being halved, reduces to the very simple form

$$f_{\frac{1}{2}} = 0.0625(-f_{-1} + 9f_0 + 9f_1 - f_2)$$

or, if it is necessary to include differences up to the fifth,

$$f_{\frac{1}{2}} = \frac{1}{256}(3f_{-2} - 25f_{-1} + 150f_0 + 150f_1 - 25f_2 + 3f_3)$$

Table XVII is a critical table giving 4-decimal values of B'' , to be used when $\Delta_0'' + \Delta_1''$ is greater than 1000 but less than 10,000. Table XVIII is a similar 3-decimal table, which suffices when $\Delta_0'' + \Delta_1''$ is less than 1000, since the maximum error of a value taken from a critical table is only half a unit in the last decimal, whereas in ordinary tables where interpolation is required it may amount to a unit.

Table XIX contains 5-decimal values of the second-difference Everett and the 4-point Lagrange coefficients at interval 0.01. The tabulated coefficients would be exact if carried to seven decimals, but the rounding-off in L_{-1} is equal and opposite to that of L_2 , and similarly for L_0 and L_1 . Thus for $n = 0.23$

$$L_{-1} = -0.05224 \ 45$$

$$L_2 = -0.03630 \ 55$$

$$L_0 = +0.83818 \ 35$$

$$L_1 = +0.25036 \ 65$$

On account of this peculiar property the tabulated 5-decimal values may frequently be used for the interpolation of 6- and even 7-figure numbers, if interpolating to exact hundredths. Everett coefficients at interval 0.001 are given in Thompson's *Table of the Coefficients of Everett's Central-Difference Formula* (Cambridge University Press).

Table XIX also gives critical tables of B'' and B''' . If Δ''' is greater than 1000 the table of B'' should not be used, but the Everett formula and the 5-decimal values of E_0'' and E_1'' .

Table XX is a critical table giving 3-decimal values of the second-difference Everett coefficients, and may be used when the second difference does not exceed 1000.

Table XXI gives values of 0.184 Δ'' , with argument Δ'' , for use with the throw-back from fourth to second differences.

The following examples illustrate the use of the formulæ and tables given. Although the full details of each are given, a computer using a calculating machine would accumulate the products on the machine, writing nothing but the interpolate.

Example 1.—To find y when $x = 1.2789$.

x	y	Δ'	Δ''	Δ'''
1.1	+0.8912			
		+408		
1.2	.9320		-92	
		+316		-6
1.3	.9636		-98	
		+218		
1.4	+0.9854			

Using Bessel's formula and Table XVIII,

$$\begin{aligned}
 f_0 &= y \text{ for } x = 1.2 &= +0.9320 \\
 n\Delta' &= +0.789 \times +316 &= +2493 \\
 B''(\Delta_0'' + \Delta_1'') &= -0.042 \times -190 &= +80 \\
 \text{Sum} &= f_n &= +0.9577
 \end{aligned}$$

Note that $\Delta_0'' + \Delta_1'' = -92 - 98$ or $+218 - 408 = -190$, the latter form being convenient when first differences only are printed.

Example 2.—To find y when $x = 1.2345$.

x	y	Δ'	Δ''	Δ'''	Δ''''
1.0	+0.54030				
		-8670			
1.1	.45360		-454		
		-9124		+92	
1.2	.36236		-362		+3
		-9486		+95	
1.3	.26750		-267		+1
		-9753		+96	
1.4	.16997		-171		
		-9924			
1.5	+0.07073				

Using Bessel's formula and Tables XVIII and XIX,

$$\begin{aligned} f_0 &= y \text{ for } x = 1.2 &= +0.36236 \\ n\Delta' &= +0.345 \times -9486 &= -32727 \\ B''(\Delta_0'' + \Delta_1'') &= -0.056 \times -629 &= +352 \\ B'''\Delta''' &= +0.006 \times +95 &= +6 \\ \text{Sum} &= f_n &= +0.32999 \end{aligned}$$

Using Everett's formula and Table XX,

$$\begin{aligned} f_0 &= y \text{ for } x = 1.2 &= +0.36236 \\ n\Delta' &= +0.345 \times -9486 &= -32727 \\ E_0''\Delta_0'' &= -0.062 \times -362 &= +224 \\ E_1''\Delta_1'' &= -0.051 \times -267 &= +136 \\ \text{Sum} &= f_n &= +0.32999 \end{aligned}$$

Using the Lagrange formula and Table XIX,

$$\begin{aligned} L_{-1}f_{-1} &= -0.06233 \times +0.45360 &= -0.028273 \\ L_0f_0 &= +0.72901 \times +0.36236 &= +0.264164 \\ L_1f_1 &= +0.38398 \times +0.26750 &= +0.102715 \\ L_2f_2 &= -0.05066 \times +0.16997 &= -0.008611 \\ \text{Sum} &= f_n &= +0.32999 \end{aligned}$$

Example 3.—To find y when $x = 0.24680$.

x	y	Δ'	Δ''	Δ'''	Δ^{iv}
0.0	+1.00000				
		-4865			
0.1	0.95135		+1547		
		-3318		-299	
0.2	.91817		+1248		+100
		-2070		-199	
0.3	.89747		+1049		+68
		-1021		-131	
0.4	.88726		+918		
		-103			
0.5	+0.88623				

Using Bessel's formula and Tables XVII and XIX,

$$\begin{aligned} f_0 &= y \text{ for } x = 0.2 &= +0.91817 \\ n\Delta' &= +0.4680 \times -2070 &= -9688 \\ B''(\Delta_0'' + \Delta_1'') &= -0.0622 \times +2297 &= -1429 \\ B'''\Delta''' &= +0.001 \times -199 &= -2 \\ B^{iv}(\Delta_0^{iv} + \Delta_1^{iv}) &= +0.012 \times +168 &= +20 \\ \text{Sum} &= f_n &= +0.90707 \end{aligned}$$

Using the modified Everett formula and Table XIX,

$$\begin{aligned} f_0 &= y \text{ for } x = 0.2 &= +0.91817 \\ n\Delta' &= +0.4680 \times -2070 &= -9688 \\ E_0''\Delta_0'' &= -0.0636 \times +1248 &= -794 \\ E_1''\Delta_1'' &= -0.0609 \times +1049 &= -639 \\ B^{iv}(\Delta_0^{iv} + \Delta_1^{iv}) &= +0.012 \times +168 &= +20 \\ \text{Sum} &= f_n &= +0.90707 \end{aligned}$$

Using Bessel's formula with Tables XVII and XIX and the throw-back with Table XXI,

$$M_0'' + M_1'' = +2297 - 31 = +2266$$

$$f_0 = y \text{ for } x = 0.2 = +0.91817$$

$$n\Delta' = +0.4680 \times -2070 = -9688$$

$$B''(M_0'' + M_1'') = -0.0622 \times +2266 = -1409$$

$$B''\Delta'' = +0.001 \times -199 = -2$$

$$\text{Sum} = f_n = +0.90707$$

The use of the throw-back enables tables to be published in compressed form. Thus from the two lines

x	y	M''
0.2	+0.91817	+1230
0.3	+0.89747	+1036

and Everett's formula in the form

$$f_n = (1 - n)f_0 + nf_1 + E_0''M_0'' + E_1''M_1''$$

we find

$$(1 - n)f_0 = +0.5320 \times +91817 = +0.488466$$

$$nf_1 = +0.4680 \times +89747 = +0.420016$$

$$E_0''M_0'' = -0.0636 \times +1230 = -782$$

$$E_1''M_1'' = -0.0609 \times +1036 = -631$$

$$\text{Sum} = f_n = +0.90707$$

Satellites of Saturn

The adopted position of the ring-plane (page 832) is that of H. Struve. A revised position is given by G. Struve in *Veröffentlichungen der Universitäts-Sternwarte zu Berlin-Babelsberg*, Band VI, Heft 4, page 49; this position is being used in the *Nautical Almanac* from 1936 onwards. It has not been used in this *Almanac*, as the quantities U, B, P, U', B', P' on pages 622–623 were in print before the work on the preparation of the tables on pages 840–841 was begun.

PROPER NAMES

<i>Achernar</i>	α Eridani	<i>Denebola</i>	β Leonis
<i>Aldebaran</i>	α Tauri	<i>Dubhe</i>	α Ursæ Majoris
<i>Algenib</i>	γ Pegasi	<i>Fomalhaut</i>	α Piscis Australis
<i>Algol</i>	β Persei	<i>Markab</i>	α Pegasi
<i>Altair</i>	α Aquilæ	<i>Mira</i>	\circ Ceti
<i>Antares</i>	α Scorpii	<i>Polaris</i>	α Ursæ Minoris
<i>Arcturus</i>	α Bootis	<i>Pollux</i>	β Geminorum
<i>Bellatrix</i>	γ Orionis	<i>Procyon</i>	α Canis Minoris
<i>Betelgeuse</i>	α Orionis	<i>Regulus</i>	α Leonis
<i>Canopus</i>	α Argus	<i>Rigel</i>	β Orionis
<i>Capella</i>	α Aurigæ	<i>Sirius</i>	α Canis Majoris
<i>Castor</i>	α Geminorum	<i>Spica</i>	α Virginis
<i>Deneb</i>	α Cygni	<i>Vega</i>	α Lyræ

Mean places of stars between declinations $+80^\circ$ and -80° are given on pages 296–306 and of circumpolar stars on page 307. The page numbers given below are the pages on which the apparent places are to be found.

Name	Cat. No.	Page	Name	Cat. No.	Page	Name	Cat. No.	Page	Name	Cat. No.	Page
Andromedæ			Aquarii			Argus			Arietis		
α	3	358	λ	1428	514	α	396	401	α	125	371
β	69	365	μ	1293	502	β	566	418	β	114	369
γ	124	370	ξ	1338	507	γ	498	412	δ	187	378
δ	36	362	σ	1404	511	δ	531	415	ϵ	175	376
ϵ	35	361	ψ^a	1455	517	ϵ	508	413	θ	135	372
μ	55	364	c^a	1444	516	ζ	492	411	σ	170	376
Antliæ			Aquilæ			η	658	428	τ^1	197	379
α	636	426	α	1218	494	θ	656	427	Aurigæ		
ι	668	429	β	1222	495	ι	570	418	α	319	392
Apodis			γ	1214	494	κ	573	420	β	368	398
α	881	455	δ	1185	491	λ	560	417	ϵ	301	390
γ	998	467	ϵ	1158	488	μ	660	428	η	307	390
Aquarii			ζ	1160	488	ν	406	402	θ	369	399
α	1370	508	θ	1237	497	ξ	475	410	ι	299	389
β	1332	506	λ	1162	489	π	445	407	Bootis		
γ	1391	510	μ	1197	492	ρ	495	412	α	852	452
δ	1430	514	ω	1177	491	σ	457	408	β	906	457
ϵ	1287	502	Aræ			τ	419	404	γ	870	453
η	1409	511	α	1064	476	υ	600	423	δ	919	459
θ	1386	510	β	1055	475	ψ	580	420	ϵ	885	455
κ	1410	511	ζ	1031	472				η	832	449

INDEX TO PLACES OF STARS, 1935

859

Mean places of stars between declinations $+80^\circ$ and -80° are given on pages 296-306 and of circumpolar stars on page 307. The page numbers given below are the pages on which the apparent places are to be found.

Name	Cat. No.	Page	Name	Cat. No.	Page	Name	Cat. No.	Page	Name	Cat. No.	Page
Bootis			Cassiopeiae			Chamaeleontis			Draconis		
ρ	869	453	α	37	362	β	742	438	α	845	450
τ	824	448	β	4	358	Circini			β	1067	477
ψ	910	458	γ	53	363	α	877	454	γ	1095	480
f	863	453	δ	83	366	Columbae			δ	1173	490
Camelopardi			ϵ	III	369	α	349	396	ϵ	1219	495
9	293	389	Centauri			β	362	398	ζ	1042	474
Cancrī			α	875	454	Comae			η	1001	467
α	543	417	β	841	450	31	778	443	ι	931	461
β	503	413	γ	768	441	Coronae Australis			κ	760	440
γ	527	415	δ	733	436	α	1163	489	λ	701	433
η	517	414	ϵ	819	447	Coronae Borealis			χ	1123	484
κ	556	417	ζ	831	449	α	943	462	Equulei		
ξ	559	418	η	873	454	Corvi			α	1318	504
d^1	507	413	θ	843	451	β	761	440	Eridani		
83	569	419	ι	803	446	γ	740	438	α	96	367
Canis Majoris			κ	902	457	δ	755	439	β	310	391
α	411	403	λ	704	433	ϵ	735	437	γ	240	384
β	394	401	μ	828	449	Crateris			δ	221	382
γ	430	406	B	719	435	β	682	431	ϵ	210	380
δ	433	406	Cephei			δ	690	432	θ	176	376
ϵ	426	404	α	1324	505	Crucis			μ	288	388
ζ	389	400	β	1333	506	α	748	439	σ^1	251	385
η	452	408	γ	1480	519	β	775	442	τ^5	212	381
θ	422	404	ζ	1381	509	γ	757	439	v^4	261	386
σ^3	429	405	η	1288	501	δ	738	437	ϕ	134	372
22	427	405	ι	1424	513	Cygni			53	282	388
Canis Minoris			39 H	1468	326	α	1281	501	Fornacis		
α	466	409	51 H	434	310	β^1	1193	492	β	169	375
β	453	408	Ceti			γ	1255	498	κ	137	373
Canum Venat.			α	179	377	δ	1213	494	Geminorum		
12	786	444	β	39	362	ϵ	1284	501	α	458	409
Capricorni			γ	163	375	ζ	1314	504	β	470	410
α^2	1251	498	δ	154	374	61	1308	503	γ	403	402
β	1252	498	ζ	109	368	Delphini			δ	447	407
δ	1349	507	θ	81	366	α	1277	500	ϵ	408	402
ζ	1328	506	ι	16	359	ϵ	1267	499	ζ	428	405
θ	1305	503	ν	150	374	Doradus			η	381	400
ι	1325	505	ξ^1	130	371	α	279	387	μ	390	400
ρ	1258	499	ξ^2	143	374	β	345	396	ν	399	401
4	1250	497	σ	136	373	Geminorum			ξ	409	403
Carinae			π	164	375	Geminorum			χ	489	411
Q	463	409	v	120	370	Geminorum			ι	373	399
q	625	425	2	1504	358	Geminorum			51	439	406
			12	25	361						
			20	52	363						
			67	133	372						

INDEX TO PLACES OF STARS, 1935

Mean places of stars between declinations $+80^\circ$ and -80° are given on pages 296-306 and of circumpolar stars on page 307. The page numbers given below are the pages on which the apparent places are to be found.

Name	Cat. No.	Page	Name	Cat. No.	Page	Name	Cat. No.	Page	Name	Cat. No.	Page
Groombridge			Leonis			Microscopii			Orionis		
3548	1321	324	α	617	424	γ	1301	503	α	365	398
			β	717	434	θ^1	1323	504	β	318	392
Gruis			γ	627	425	Monocerotis			γ	330	393
α	1374	509	δ	683	431				δ	336	394
β	1416	512	ϵ	597	422	26	468	410	ϵ	344	395
γ	1356	508	θ	684	432	30	509	414	ζ	350	397
ϵ	1421	513	μ	603	423				η	328	393
Herculis			ξ	583	421	Muscae			ι	343	395
α	1045	474	\omicron	594	422	α	764	440	κ	357	397
β	1005	468	π	612	424	β	773	442	ν	377	399
γ	992	467	ρ	641	427	δ	787	444	\omicron	327	392
δ	1046	474	τ	697	432				π^3	291	389
ϵ	1036	473	υ	706	434	Normae					
ζ	1017	470	χ	677	430	γ	986	466	Pavonis		
η	1018	470	$\dot{\alpha}$	672	429				α	1256	499
μ	1084	479	l	662	428	Octantis			β	1279	500
π	1047	475	Leporis			β	1417	356	γ	1327	505
89	1091	480	α	338	395	δ	855	344	δ	1233	497
Horologii			β	333	394	η	676	342	ϵ	1223	496
α	256	385	ϵ	308	391	\omicron	13	328	ζ	1133	485
μ	183	378	μ	316	391	ρ	935	346	η	1079	478
45 G	211	380	Librae			σ	1207	350	λ	1145	486
Hydrae			α	891	456	υ	1390	354	Pegasi		
α	576	420	β	920	460	A	462	338	α	1438	515
γ	802	445	ι	915	459	9 B	149	330	β	1437	515
ϵ	532	416	ξ^a	899	456	10 B	173	332	γ	10	359
ζ	539	416	\omicron^3	926	460	12 B	374	336	ϵ	1345	507
κ	593	422	σ^*	907	458	10 G	649	340	ζ	1415	512
μ	633	426	2	860	452	44 G	1212	348	η	1418	512
ν	663	429	32	933	461	48 G	1260	352	ι	1375	509
ξ	702	433	Lupi			Ophiuchi			μ	1423	513
π	842	451	α	878	455	α	1070	477	τ	1457	517
Hydri			β	901	457	β	1080	479	ϕ	1491	520
α	119	370	γ	941	462	δ	983	465	16	1357	508
β	22	360	δ	923	460	ϵ	987	466	72	1471	518
γ	234	383	ζ	914	458	ζ	1013	469			
δ	138	373	Lyncis			η	1040	473	Persei		
Indi			θ	1052	475	κ	1034	472	α	200	379
α	1270	500	40	571	419	λ	1006	468	β	185	378
			Lyræ			ν	1096	481	γ	181	377
			α	1134	484	σ	1060	476	δ	218	381
			β	1147	486	20	1024	471	ϵ	238	383
			γ	1157	487	30	1035	472	ζ	235	383
			Mensæ			72	1105	481		182	377
			31 G	359	334						

* Formerly called γ Scorpii.

INDEX TO PLACES OF STARS, 1935

861

Mean places of stars between declinations $+80^{\circ}$ and -80° are given on pages 296-306 and of circumpolar stars on page 307. The page numbers given below are the pages on which the apparent places are to be found.

Name	Cat. No.	Page	Name	Cat. No.	Page	Name	Cat. No.	Page	Name	Cat. No.	Page
Phœnicis			Sagittarii			Sextantis			Ursæ Majoris		
α	23	361	μ	1109	482	22	624	425	μ	628	426
β	63	365	ξ	1155	487	34	654	427	σ	512	414
γ	85	367	π	1166	490				ν	601	423
ι	1474	518	σ	1150	487				ψ	680	431
Pictoris			τ	1161	489	Tauri			Ursæ Minoris		
α	417	403	ϕ	1138	485	α	278	387	α	95	308
20 G	335	394	ψ	1172	490	β	331	393	β	896	456
Piscis Australis			c	1231	496	γ	262	386	γ	928	461
α	1431	514	f	1211	493	ϵ	270	387	δ	1097	320
Piscium			g	1227	496	ζ	346	396	ϵ	1032	318
β	1436	515	h	1198	493	η	228	382	ζ	957	463
γ	1453	516	30	1146	486	ι	305	390	λ	1153	322
δ	47	363	54	1203	493	λ	241	384	4 B	511	312
ϵ	59	364	Scorpii			\circ	201	379	6 B	743	314
ζ	74	366	α	1002	468	τ	284	388	57 B	909	316
η	88	367	β	972	465	A	244	384	Velorum		
ι	1479	518	γ^*	907	458	f	207	380	N	584	421
κ	1464	517	δ	967	465	Π	217	381	q	619	424
λ	1482	519	ϵ	1023	471	17	224	382	Virginis		
ν	99	368	η	1041	473	43	249	385	α	806	446
σ	104	368	θ	1071	478	130	354	397	β	718	435
ω	1500	520	ι^1	1081	479	Telescopii			γ	769	441
d	18	360	κ	1075	478	α	1120	483	δ	784	444
27	1498	520	λ	1066	477	59 G	1186	491	ϵ	788	445
44	21	360	μ	1026	471	Trianguli			ζ	814	447
72	61	365	π	964	464	α	110	369	η	744	438
Puppis			σ	989	466	β	126	371	θ	792	445
9	478	411	τ	1008	469	Trianguli Australis			κ	849	452
20	500	412	ν	1063	476	α	1019	470	ν	712	434
Pyxidis			G	1086	480	β	959	464	σ	730	436
α	529	415	24	1016	469	γ	918	459	π	726	436
θ	572	419	Sculptoris			Tucanæ			ρ	770	441
Reticuli			α	57	364	α	1387	510	τ	839	450
α	259	386	δ	1488	519	γ	1452	516	ψ	781	443
Sagittarii			Scuti			ζ	17	359	ι	807	447
γ	1103	481	4 H	1136	485	Ursæ Majoris			m	821	448
δ	1114	482	Serpentis			α	675	430	35	776	442
ϵ	1118	483	α	951	462	β	674	430	94	844	451
ζ	1159	488	γ	963	464	γ	722	435	Volantis		
η	1111	482	ϵ	958	463	δ	739	437	δ	449	407
ι	1221	495	η	1116	483	ϵ	782	443	Vulpeculæ		
λ	1125	484	μ	955	463	ζ	805	446	α	1190	492
						η	826	448	32	1296	502
						θ	581	421			
						ι	542	416			

* Now called ϵ Libræ.

In the following index the subject should be sought under its principal noun, e.g. *Moon, phases of* and not *Phases of Moon*, or *Day, Julian* rather than *Julian Day*. The references given are usually to the tabular matter only, so that in many cases the information sought will be obtained by turning to the pages in the Explanation (pages 754-857) covering the tabular matter concerned.

Abbreviations and symbols	750
Aberration, differential	290
Calendar	I, 754
Contractions	751
Co-ordinates, geocentric, tables for computing	726
Day, Easter	I
Day, Julian	2, 714
Distance, astronomical unit of	778
Eclipses	521
Ecliptic, obliquity of	54, 776
Equinox, standard of 1950.0, reduction to and from	54, 730
Equinoxes	640, 775
Interpolation, tables for	742
Jupiter, ephemeris of	208, 252
ephemeris for physical observations of	590
satellites of	596
Mars, ephemeris of	200, 248
ephemeris for physical observations of	580
satellites of	586
Mercury, ephemeris of	180, 184
illuminated disc of	578
Moon, ephemeris of	56, 72, 164
ephemeris for physical observations of	570
mean elements of	55
phases of	163
table for optical libration of	568
Moonrise and moonset	664
Neptune, ephemeris of	232, 260
satellite of	638
stellar magnitude of	845
Notation	752
Numbers, day	262, 266, 274
Observatories	682

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